Sound Transit 2

A Mass Transit Guide

The Regional Transit System Plan
for Central Puget Sound

July 2008

SOUNDTRANSIT
RIDE THE WAVE

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Adopted by Sound Transit Board, 7/24/08

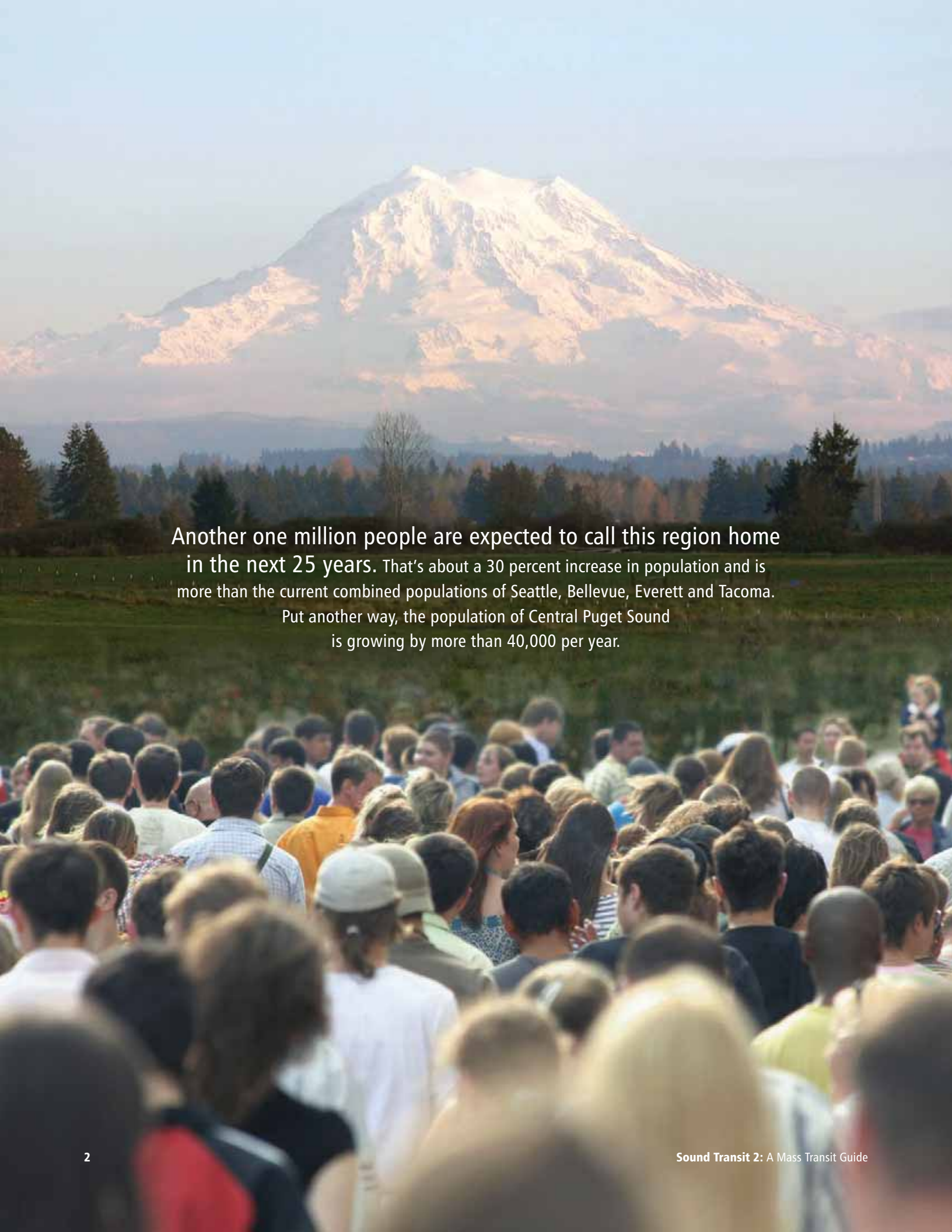
Link light rail • Sounder commuter rail • ST Express regional bus • Tacoma Link light rail

Easy connections to more places for more people.

—Sound Transit vision statement

Sound Transit plans, builds, and operates regional transit systems and services to improve mobility for Central Puget Sound.

—Sound Transit mission statement



Another one million people are expected to call this region home in the next 25 years. That's about a 30 percent increase in population and is more than the current combined populations of Seattle, Bellevue, Everett and Tacoma. Put another way, the population of Central Puget Sound is growing by more than 40,000 per year.

Introduction

Sound Transit proposes to improve and expand the regional mass transit system. The agency has been working since 1996 on the first phase of a regional mass transit system in the Central Puget Sound region that includes Link light rail, Sounder commuter trains and ST Express buses. This initial phase, called *Sound Move,* was approved by voters in 1996 in response to burgeoning growth and traffic problems.

Sounder commuter trains currently operate in a 74-mile corridor from Everett to Tacoma, with construction of an eight-mile extension to Lakewood underway. ST Express buses operate on every major highway in the region. Link light rail serves Downtown Tacoma, and it will open for service between Seattle and Sea-Tac International Airport in 2009. Together, these services carry more than 14 million riders a year reliably around the region to jobs, shopping, school, sporting events and other places they need to go.

Construction of the Link light rail extension between Downtown Seattle and the University District is expected to begin in late 2008, with service to start in 2016.

Even with those investments, however, improving transportation continues to be one of the biggest challenges facing this region.

Another one million people are expected to call this region home in the next 25 years. That's about a 30 percent increase in population and is more than the current combined populations of Seattle, Bellevue, Everett and Tacoma. Put another way, the population of the Central Puget Sound region is growing by more than 40,000 people per year.

By the year 2030, growth will lead to a 35 percent increase in employment and a 30 percent increase in vehicle travel in the region. By 2030, the typical commuter could spend nearly an entire work week of additional time stuck in traffic. Weekday rush hour could last from breakfast through dinner, strangling the movement of traffic and freight, jeopardizing our economy, and hurting the environment.

With a strong mass transit foundation in place and more growth on the way, additional investment is needed to ensure mobility for people and to help the Central Puget Sound region's transportation system run smoothly. An expanded mass transit system that builds on what we have is more important than ever.

In response, Sound Transit is proposing a plan that builds on the *Sound Move* program called Sound Transit 2. The Sound Transit 2 Plan (ST2) would expand the existing light rail system to serve three major travel corridors. Link light rail would extend from North Seattle into Snohomish County, across Lake Washington into East King County, and south of Sea-Tac International Airport to Federal Way. ST2 would also expand Sounder commuter rail and ST Express regional bus service significantly. A map showing ST2 Regional Transit System Plan improvements can be found on Page 16.

The ST2 Plan was developed through an open public process over a four-year period. During that period, Sound Transit coordinated closely with cities and counties and conducted substantial public outreach. With more jobs and people on the way, the time is now to continue building our transportation future.

New light rail from Downtown Seattle to Sea-Tac Airport opens 2009; extension to UW opens 2016

74 miles of Sounder commuter rail with 10 stations

ST Express bus routes offer all-day, two-way service around the region

Tacoma Link light rail connects Tacoma Dome Station to Downtown Tacoma

More than $800 million invested in transit centers, HOV direct access ramps and park-and-ride lots

PugetPass easy transfer fare system

ST2 would extend light rail from North Seattle into Snohomish County, across Lake Washington into East King County, and south of Sea-Tac International Airport to Federal Way.

Light rail trains carry people to and from East King County in this conceptual image. By 2020, nearly 40 percent of all Bellevue jobs and about 62 percent of its future population growth is projected to be in the downtown core. (Source: The Bellevue Downtown Implementation Plan)

ST2: The Future

ST2 includes a major expansion of the Link light rail system. Light rail is currently operating in Downtown Tacoma, and a nearly 16-mile line currently under construction between Downtown Seattle and Sea-Tac International Airport is scheduled to open in 2009. An extension from Downtown Seattle to the University of Washington is scheduled to open in 2016.

The ST2 Plan builds on these Link light rail lines and the region's investment in Sounder commuter rail and ST Express bus service. ST2 proposes a future in which someone can ride a light rail train to a job or appointment from the Overlake Transit Center area of Redmond west to Bellevue, Downtown Seattle or the University of Washington; from Lynnwood to Northgate and on to the University of Washington, Downtown Seattle and the airport; or from the Redondo/Star Lake area near Federal Way to the vicinity of Highline Community College, the airport and on to Downtown Seattle. The ST2 Plan would extend the rail system to serve nearly 50 percent of the region's current population and employment centers, providing a reliable transportation option for most of the region's citizens.

ST2 would increase ST Express bus service by 17 percent.

Because it runs on its own tracks separated from traffic, light rail is quick and reliable. It will take 19 minutes to travel on a light rail train from Downtown Bellevue to the International District Station and nearby Qwest and Safeco fields, 11 minutes from Overlake Transit Center to Downtown Bellevue, 15 minutes from Northgate to Downtown Seattle, 28 minutes from Downtown Seattle to Lynnwood, or 12 minutes from Redondo/Star Lake to the airport. And because trains are not stuck in traffic, riders can count on the ride being the same every day – rain or shine. With trains running up to 20 hours a day, and every few minutes at peak times, riders won't need to carry a schedule or map.

When all proposed ST2 projects are completed, half of all work trips to Downtown Seattle are expected to be on transit. The number of people taking transit to work during peak commuting hours will increase in the other major regional centers being served by the plan's investments. Together these investments will enable more people to get around reliably and predictably. With ST2 in place, Sound Transit ridership is projected to grow to over 100 million per year in 2030. The system will also have additional capacity to absorb future growth well beyond 2030.

When all proposed ST2 projects are completed, half of all work trips to Downtown Seattle are expected to be on transit.

The new investments proposed in the ST2 Plan are estimated to cost approximately $13.4 billion (including inflation) to construct over the next 15 years. These regional investments in new mass transit infrastructure include regional express bus, commuter rail and light rail facilities. In addition to these capital improvements, the plan provides funding for operating and maintaining the system. Operations and maintenance costs are estimated at $1.9 billion (including inflation) through 2023. The financial plan also funds reserves and debt service – for detailed information see the "Paying for the System" section later in this document.

The ST2 Plan is consistent with established long-range regional transportation and land use plans. The Puget Sound Regional Council (PSRC) created the Vision 2040 plan to be a strategy for directing growth in an environmentally responsible way, while fostering economic development and providing efficient transportation. In addition, the PSRC created the Destination 2030 plan to be the region's comprehensive long-range transportation plan. Grounded in Vision 2040's growth management and transportation policies, Destination 2030 provides a multimodal plan for investing in roads, ferries, transit and freight mobility through the year 2030. Destination 2030 is now being updated by the PSRC to reflect the transportation needs of Vision 2040 and is expected to be complete in 2010.

As the Regional Transit Authority (under Chapters 81.104 and 81.112 RCW), Sound Transit is responsible for regional high-capacity transit system planning in the context of Destination 2030. Sound Transit updated its Regional Transit Long-Range Plan in 2005. ST2 is the next phase of transit improvements for the Central Puget Sound region.

The ST2 light rail expansions have the long-term capacity to serve trains running every four minutes in each direction, with each train carrying up to 800 people.

In the first half of 2008, ridership on ST Express regional buses and Sounder commuter rail grew by 14 percent and 29 percent respectively over the same period in 2007.

The ST2 Plan

ST2 will substantially expand the regional mass transit system by extending and adding more light rail lines and increasing commuter rail and regional express bus service. This new service will enhance and add high-capacity transit in the region's main travel corridors. The result will be service that cuts through congestion and provides ridership capacity to accommodate the region's needs.

System access

Value from a high-capacity transit system comes from the ability of that system to transport people reliably, rapidly and efficiently. That is only possible when people are able to access the system. Access solutions vary by transit mode and community. In recognition of these varying needs, Sound Transit will, in consultation with its local transit partners and host jurisdictions, conduct access and demand studies for its passenger facilities to evaluate a full range of needs and potential improvements to meet those needs. Improvements may include:

- Pedestrian improvements at or near transit facilities;
- Additional bus/transfer facilities for improving bus connections;
- Expanded parking at or near transit facilities;
- Off-site/satellite parking along existing transit routes that connect to the facility, including transit priority treatments to improve the speed and reliability of those routes;
- Bicycle access and storage at or near transit facilities; and
- New/expanded drop-off areas to encourage ride sharing.

Link light rail extensions

ST2 adds approximately 36 miles of new light rail by extending north from the University of Washington to Northgate and Lynnwood, south from Sea-Tac International Airport to the vicinity of the Redondo/Star Lake area near Federal Way, and east from Seattle to Bellevue and the Overlake Transit Center area of Redmond. Light rail trains will provide service to at least 19 planned new stations up to 20 hours a day and every few minutes during peak commuting periods.

In addition, funding is established in ST2 for further planning, preliminary engineering and environmental review for future light rail extensions. ST2 also includes a strategic right-of-way preservation program to ensure crucial properties can be protected or acquired. This will allow Sound Transit to secure property for future extensions to provide more certainty to affected property owners, and to avoid the complications and additional financial expense of acquiring property that has been recently redeveloped.

South Corridor

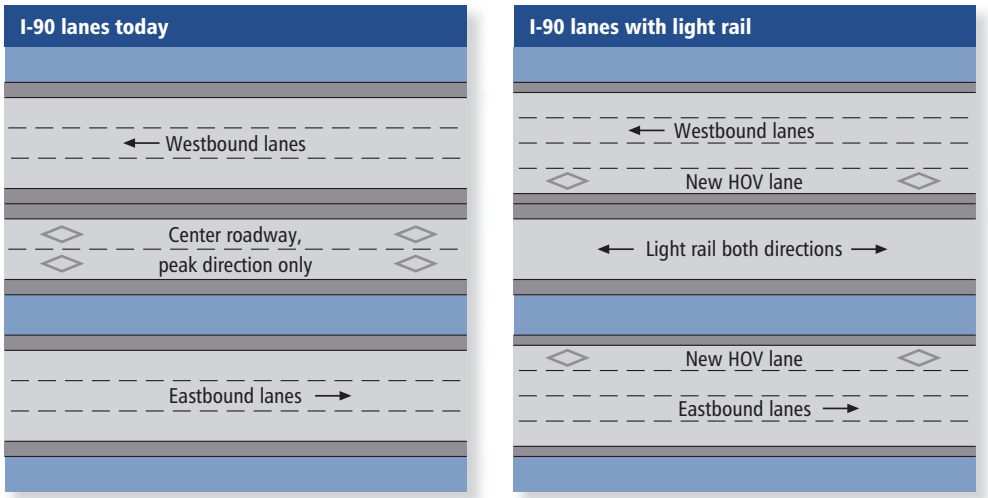
ST2 adds a light rail extension from Sea-Tac International Airport to the Redondo/Star Lake area near Federal Way, with three planned new stations at South 200th Street, the vicinity of Highline Community College (scheduled to open by 2020), and Redondo/Star Lake (scheduled to open by 2023). Funds, in the form of a capital contribution, are also programmed to provide for the expansion of the Tacoma Link light rail system if other public or private entities provide matching funds. Extensions that have been studied and are under consideration are north to the

The ST2 Plan's light rail extension to Northgate will begin service by 2020.

Tacoma General Hospital area or east to Fife. Funding is also provided to complete environmental documentation, preliminary engineering and partial right-of-way acquisition for light rail between Federal Way and Tacoma.

East Corridor

ST2 expands light rail across Lake Washington via I-90 from Downtown Seattle to the Overlake Transit Center area of Redmond, with nine planned new stations serving Rainier Avenue/I-90, Mercer Island, South Bellevue, Downtown Bellevue, Overlake Hospital, the Bel-Red corridor, Overlake Village and Overlake Transit Center. The line is scheduled to be open to Bellevue by 2020 and Overlake Transit Center by 2021. Funding is also provided to complete environmental documentation and preliminary engineering for light rail between Overlake Transit Center and Downtown Redmond.



Adding light rail to I-90's Lake Washington crossing will dramatically increase the people-carrying capacity of the bridge while the existing number of vehicle lanes is maintained. This will be achieved by adding a new HOV lane in each direction on the existing bridge, as shown at left.

Bringing fast, frequent and reliable light rail to the Redondo/Star Lake area near Federal Way will position the system for future southward expansion. The plan provides funds for environmental documentation, preliminary engineering and partial right-of-way acquisition for light rail between Federal Way and Tacoma.

North Corridor

ST2 expands light rail north from the University of Washington to Lynnwood, adding seven planned new stations in the University District, the Roosevelt neighborhood, Northgate, 145th Street/Jackson Park, Shoreline, Mountlake Terrace and Lynnwood. This extension is scheduled to be open to Northgate by 2020 and to Lynnwood by 2023. If additional funding and/or cost savings are available, preliminary engineering and environmental review for the extension of light rail from Lynnwood Transit Center to Everett may be performed as part of the ST2 program.

ST2 also includes a new streetcar connector line between Downtown Seattle, First Hill and the future Capitol Hill light rail station. The new connector will also provide convenient access to the Sounder commuter rail system and regional bus services.

Sounder commuter rail improvements

The ST2 Plan builds on the investments already made for providing passenger rail service between Everett and Lakewood along rail lines owned by Sound Transit and the Burlington Northern Santa Fe (BNSF) Railway Company.

ST2 increases the capacity of the highly utilized Tacoma-Seattle service through additional trains and expanded train lengths. Four round trips will be added to this service. Service capacity will be further expanded by increasing the number of passenger cars per train from seven to eight, and extending platforms at some stations. Additional locomotives and passenger cars will be acquired to support this capacity and service expansion.

On the Lakewood-Tacoma-Seattle line, ST2 also includes an expanded permanent Sounder station in Tukwila and access improvements for commuter rail and bus riders at the Kent, Auburn, Sumner, Puyallup, Tacoma Dome, South Tacoma and Lakewood stations. The ST2 Plan also provides for improvements on existing tracks in Tacoma, including Tacoma Rail tracks that are used by Sounder.

Kent Station is one of the region's numerous multimodal facilities where trains, buses, bikes and cars connect.

On the Everett-Seattle line, potentially in conjunction with Washington State Ferries multimodal terminal improvement projects, ST2 includes the construction of a permanent Edmonds Station and access improvements to Mukilteo Station.

Funds are also included to construct, own and operate a commuter rail yard and shop facility to support the level of service for Sounder trains at full operational capacity, enabling the agency to more efficiently maintain and operate Sounder.

The ST2 Plan also includes two provisional commuter rail stations along the Everett-Seattle corridor at Broad Street and Ballard that can be implemented subject to the availability of additional funds.

ST Express regional bus improvements

Recognizing the recent high growth in ridership experienced by Sound Transit and all our partner transit agencies in the Central Puget Sound region, the ST2 Plan rapidly improves ST Express bus service in the highest-need corridors. Specifically, ST2 provides annual operating and fleet expansion funds to increase service levels in the following corridors – I-5 (Everett to Seattle and Tacoma to Seattle); I-90 (Issaquah to Bellevue and Seattle); I-405 (Everett to Bellevue and Renton to Bellevue); SR 167 (Puyallup, Sumner, Auburn, Kent, Tukwila and Renton to Bellevue); and SR 522 (Woodinville and Bothell to Seattle) – by improving service frequency, expanding hours of operation and adding trips to relieve overloads. It also includes new routes in the SR 520 corridor to further develop bus rapid transit (BRT) connecting Redmond, Bellevue, the University of Washington and Downtown Seattle, taking advantage of transit speed and reliability improvements programmed as part of the Washington State Department of Transportation (WSDOT) SR 520 Bridge Replacement and HOV Project.

The ST2 Plan will provide bus rapid transit service on the SR 520 corridor.

In conjunction with King County Metro Transit bus services in the SR 520 corridor, Sound Transit will restructure ST Express services to improve overall service reliability and frequencies to at least every 15 minutes in both directions all day long on weekdays. Sound Transit will also seek to provide improved passenger amenities such as real-time next bus arrival information at stations. High service levels, streamlined transit facilities and congestion management will result in a fast, reliable and high-capacity BRT system in the corridor.

Beginning in 2009, ST2 includes a sufficient number of buses and the operating funds to provide a total of 100,000 annual platform hours above *Sound Move* planned levels. ST2 continues this service hour expansion on I-5, I-405, SR 520, SR 522, SR 167 and I-90 through the 15-year life of the plan. In cooperation with Community Transit in Snohomish County, ST2 provides significant investment in expanding ST Express service levels by 30 percent in the I-5 and I-405 corridors from Everett to Seattle and Bellevue respectively.

Sound Transit will work with WSDOT, Community Transit, Everett Transit, King County Metro and Pierce Transit to find solutions to rising congestion on HOV facilities in an effort to improve bus speed and reliability.

Throughout implementation, Sound Transit will work with WSDOT, Community Transit, Everett Transit, King County Metro and Pierce Transit to find solutions to rising congestion on HOV facilities in an effort to improve bus speed and reliability.

As bus maintenance capacity and fleet become available, Sound Transit will implement additional service as quickly as possible. Total annual ST Express service hours across the region will be increased by about 17 percent by 2020. ST2 also includes contributions from Sound Transit to help fund new or improved transit centers in Burien and Bothell in partnership with others.

When light rail opens in the various corridors, the majority of ST Express service in those corridors will be redeployed, resulting in a net overall increase in transit service.

While *Sound Move* included high-occupancy vehicle (HOV) access projects that make it easier for buses to merge into freeway HOV lanes, no new such projects are included in ST2. Park-and-ride expansion, HOV direct access ramps and other system access improvement projects are a high priority in Snohomish County. Such projects at regional system access facilities in Snohomish County may be built if sufficient additional funding and/or cost savings are identified in the ST2 program. Sound Transit continues to assume that WSDOT will fund and complete construction of the core HOV lane system in accordance with its freeway HOV policy. Funding is in place for Sound Transit's share of HOV projects underway on I-90 across Lake Washington and in Renton. These are *Sound Move* projects being implemented in partnership with WSDOT.

Eastside rail corridor partnership

The ST2 Plan sets aside funds that may be used in connection with rail passenger development and associated work that may be undertaken by other local governments and public agencies for long-term passenger rail service on an existing BNSF line. This rail line, portions of which BNSF intends to abandon and which the Port of Seattle is purchasing through the federal rail-banking process, stretches from the city of Snohomish to the city of Renton, east of Lake Washington. The State of Washington has directed Sound Transit and the PSRC to complete a feasibility study of potential passenger rail on this corridor. In addition, other parties in the region have expressed an interest in passenger rail service on this line.

Eastside ST*art* projects, like the ones at Bellevue Transit Center, add a heightened level of value to the surrounding community and help create a sense of place for residents, employees and transit users.

The ST2 Plan increases ST Express regional bus service by 17 percent.

Any future passenger rail service along this corridor would be implemented and operated by other public and/or private parties, particularly along the portion of the corridor located in Snohomish County outside the Sound Transit District. The ST2 Plan does not include funds to operate such passenger rail service. Sound Transit's investment in this project is limited to a maximum contribution of $50 million dollars, which may be used for engineering and design, and for the purchase of capital equipment and real estate that can either be sold or used on Sound Transit's existing transportation system. Sound Transit's investment is also contingent upon the satisfaction of the following conditions prior to December 31, 2011:

a. Completion of the Sound Transit/PSRC feasibility study and determination that passenger rail on the Eastside BNSF corridor is feasible and would be a meaningful component of the region's future transportation system, as required by state law;

b. The Sound Transit Board's determination that the ridership forecasts, financing plan, and capital and operating cost estimates and operating plan are reasonable and that the service will provide substantial benefits to the regional transportation system in the Sound Transit District; and

c. Execution of an agreement with other public or private parties regarding the implementation of a passenger rail system.

If a partnership for passenger rail on the BNSF corridor in East King County is not executed by December 31, 2011, the $50 million included in the ST2 Plan for a partnership will be reprogrammed to further the implementation of HOV BRT service in the I-405 corridor in East King County. Options for alternative investments in the I-405 corridor will be developed for Board review and approval prior to expenditure of these funds.

Real-time electronic messages at Puyallup Station tell customers when the next train will arrive.

Using the system

Sound Transit has used its research and technology and fares programs to find ways of making transit more convenient and easier to use.

For example, Sound Transit is installing vehicle location systems at its Link light rail and Sounder commuter rail stations and at some ST Express transit centers. These real-time electronic messages tell customers when the next train or bus will arrive. These electronic message signs will be in place in 2009 when the Link light rail system opens.

A decade ago, transferring between transit systems in the region required customers to have several passes or to pay a separate fare on each system. Over the last 10 years, Sound Transit has partnered with local transit agencies to create an integrated fare system that allows riders to transfer easily. In 1999, a new regional "PugetPass" was created for Sounder trains and ST Express, Community Transit, Everett Transit, Pierce Transit and King County Metro buses. These agencies are working together with the Washington State Ferries and Kitsap Transit to implement new "smart card" technology in 2009 to make it even easier to travel around the region.

Ticket vending machines allow passengers to pay their fares before getting aboard the train, speeding up service for everyone.

As part of ST2, Sound Transit will continue to explore and apply innovative technology and fare initiatives. Potential initiatives include expanding the "next bus" and "next train" electronic messaging system and installing more transit signal priority equipment to speed buses through congested intersections. Other possibilities include providing bus schedules and real-time "next bus" information on cell phones or personal handheld devices. Ticket vending machines at more locations would make it easier to buy a ticket or reload a smart card. Wireless internet access could be expanded to more Sound Transit vehicles and facilities. Electronic transit information kiosks could be installed in more places to provide more information to customers.

Planning for the future

ST2 includes funds to continue progress toward completing the regional transit system envisioned in Sound Transit's Long-Range Plan. Like *Sound Move*, ST2 is another incremental investment toward completing the larger regional high-capacity transit system. Further phases will be necessary beyond ST2 to fully build out the system envisioned in the Long-Range Plan, all subject to voter approval.

In order to advance completion of further expansions of the system beyond this ST2 Plan, funding is included for a series of planning studies. These studies will help narrow the range of alternatives, evaluate potential routes and station locations, inform local comprehensive planning, prepare for formal environmental impact review and engineering, and position the Sound Transit Board to evaluate options and establish the next highest priorities for implementation of the next phase of high-capacity transit investments in the region. All of the studies will include extensive public outreach, preliminary environmental assessment and ridership forecasting, and conceptual engineering and cost estimating.

The studies include high-capacity transit from Lynnwood to the Southwest Everett Industrial Center and to Everett; the Overlake Transit Center area of Redmond to Downtown Redmond; South Bellevue to Issaquah; the Redondo/Star Lake area near Federal Way to Tacoma; Redmond to Kirkland and on to the University District; University District to Ballard and on to Downtown Seattle; Renton to Tukwila, Sea-Tac and on to Burien; and Downtown Seattle to West Seattle and on to Burien. These studies will inform the Sound Transit Board's consideration of potential updates to Sound Transit's Long-Range Plan.

In the I-405 corridor, the focus will be on planning for BRT, the preferred long-term high-capacity transit technology identified in WSDOT's I-405 Corridor Program Master Plan. This study will review current transit service and capital improvements in the corridor being implemented by Sound Transit and other transportation agencies, and explore opportunities to enhance BRT system coordination and identify additional future improvements.

High-capacity transit studies will inform the region how to expand mass transit to areas such as Everett (top), Tacoma (middle), and Redmond (below) in future phases.

The investments contained in ST2 will create regional jobs both during construction and after the system is built.

Putting the System in Place

Implementing the plan in stages

Implementation of ST2 will begin after voters approve funding for the expanded regional transit system. Individual projects will be brought into service after they proceed through planning, public outreach, environmental review, preliminary engineering, property acquisition, final design, permitting, construction and start-up/testing programs. Transit centers, parking garages and commuter rail stations typically take five to six years from planning and site selection through opening for service. Light rail extensions are more complex because they travel through multiple jurisdictions, along freeway corridors or across waterways. Light rail extensions can take approximately four to seven years for planning, public outreach, environmental review, engineering and final design, and require another four to six years to build, depending on their length and complexity. Sound Transit continually coordinates with local and state governments to streamline project approval processes while ensuring environmental and community concerns are properly addressed. While putting each component of ST2 in place, Sound Transit will use a variety of proven analytical, project management and review techniques to make sure that the system provides the greatest regional benefits.

Link light rail from Downtown Seattle to the University of Washington is scheduled to open in 2016. The First Hill streetcar connector to light rail is also scheduled to open by 2016. The ST2 Plan anticipates opening the extensions to Northgate, Bellevue and the vicinity of Highline Community College in 2020. Construction will continue to the Overlake Transit Center area of Redmond with service scheduled to start in 2021, and the extensions to Lynnwood and Redondo/Star Lake are scheduled to open for service by 2023. ST2 also provides partnership funds for an extension of Tacoma Link light rail as early as 2015.

In the south corridor, Sounder commuter rail access will be improved for stations in Tukwila, Auburn, Sumner and Puyallup by 2015. Station platforms will be extended to accommodate longer trains and four new round trips will be phased into service by 2015. Station access improvements for Mukilteo, Edmonds, Kent, Tacoma, South Tacoma and Lakewood are scheduled to be completed by 2023.

ST Express regional bus service will be improved in high demand corridors in stages as additional buses and maintenance facility capacity become available. Sound Transit will put new service on the street as quickly as possible; change and add service to respond to ridership demand; and utilize access improvements such as HOV lanes and expanded parking and station access improvements as they come on line. Sound Transit will work closely with its transit partners to coordinate, integrate and maximize bus service and restructure those services in response to new rail services.

The Sound Transit Board will consider the prioritization, sequencing and actual timing of construction and service start-up of all ST2 projects. This will include ongoing consideration of factors affecting project readiness. The Board may modify project timing as appropriate, in response to the anticipated evolution of project readiness over the ST2 implementation period, and the necessity of coordinating ST2 construction with that of regional highway projects occurring in the same corridors. Some ST2 projects are located in close proximity to WSDOT projects. To the extent practicable, Sound Transit will coordinate design of its projects with WSDOT, and both parties will work to phase construction of each project to mitigate the overall construction impacts. As ST2 light rail projects are planned and designed, consideration will be given to possible future system expansion options to facilitate future extensions. For example, extensions to Issaquah and Kirkland are being considered during planning and design of the East Link project.

Throughout the implementation of the ST2 Plan, Sound Transit's Transit-Oriented Development (TOD) program will strive to achieve pedestrian-friendly development around the high-capacity transit stations. The purpose of the TOD program is to promote development that will result in reduced automobile use, higher transit ridership, enhanced livability, walkability and sustainability in the communities Sound Transit serves. A shift from the use of cars to walking and transit will result in reductions in fuel consumption and the emission of pollutants, especially greenhouse gases.

Mass transit expansions will result in reduced automobile use, higher transit ridership and enhanced livability, walkability and sustainability in communities across the region.

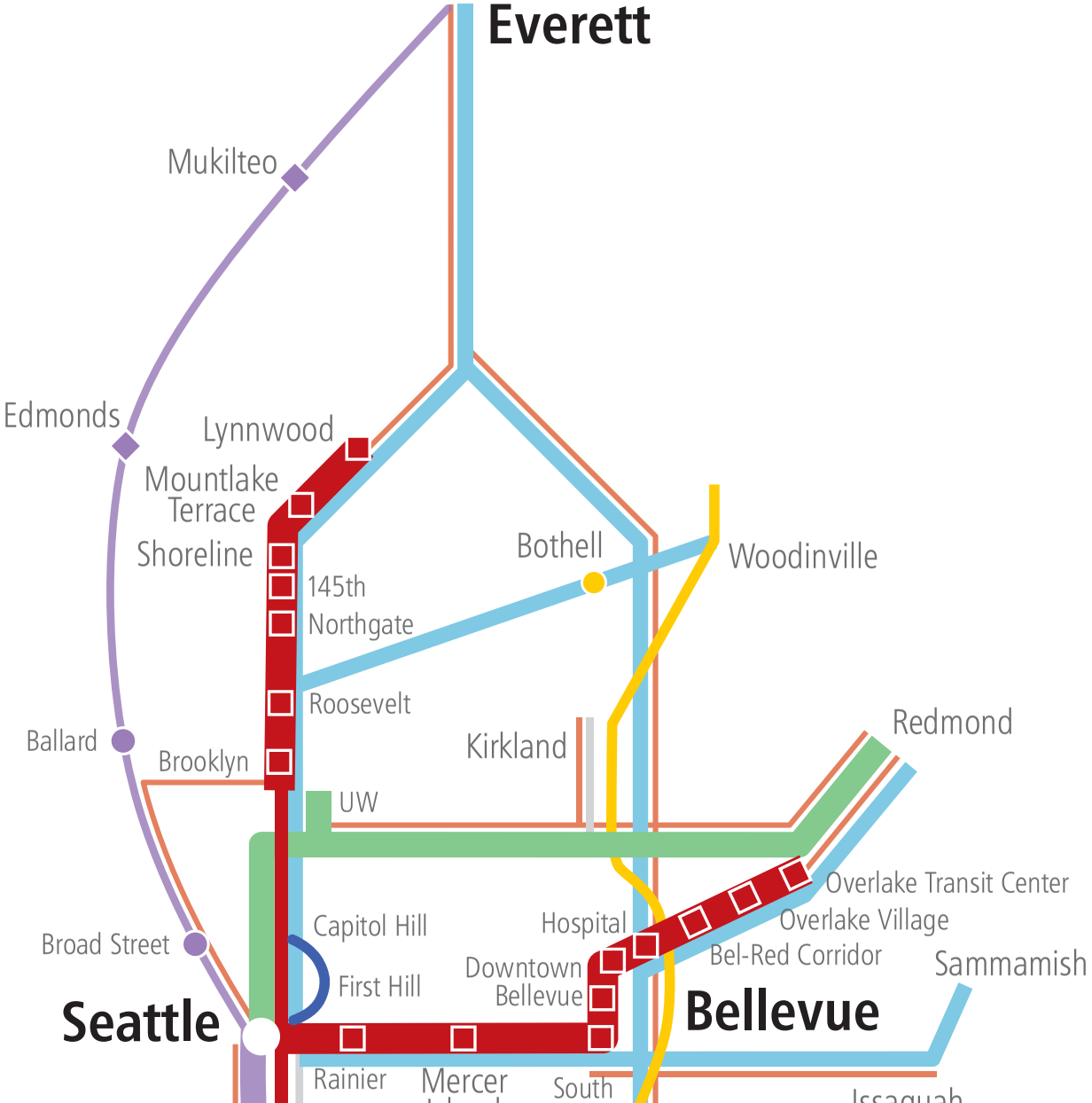
Sound Transit 2

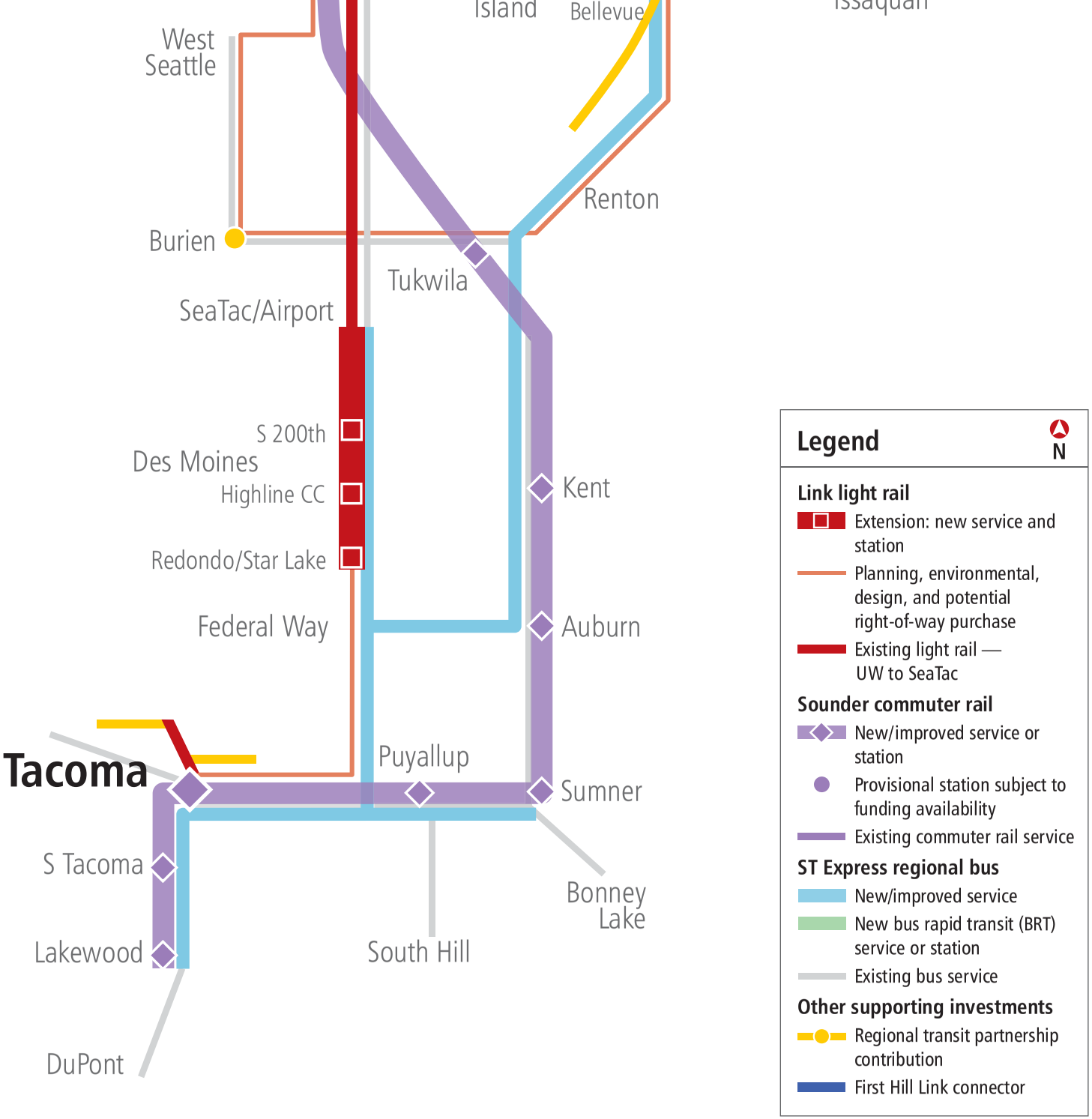
A MASS TRANSIT GUIDE

The Regional Transit System Plan for Central Puget Sound

ST2 at a glance

- Adds approximately 36 miles of new light rail, with at least 19 new stations
- Adds 4 round trip Sounder commuter rail trains between Lakewood and Seattle
- Improves Sounder stations along the entire line – north and south
- Adds 17% more ST Express regional bus service
- Adds a new streetcar connector line in Seattle




Island
Bellevue
Issaquah
West Seattle
Renton
Burien
Tukwila
SeaTac/Airport
S 200th
Des Moines
Highline CC
Redondo/Star Lake
Kent
Federal Way
Auburn
Tacoma
Puyallup
Sumner
S Tacoma
Bonney Lake
Lakewood
South Hill
DuPont
Legend
N
Link light rail
Extension: new service and station
Planning, environmental, design, and potential right-of-way purchase
Existing light rail — UW to SeaTac
Sounder commuter rail
New/improved service or station
Provisional station subject to funding availability
Existing commuter rail service
ST Express regional bus
New/improved service
New bus rapid transit (BRT) service or station
Existing bus service
Other supporting investments
Regional transit partnership contribution
First Hill Link connector

ST2 expands access to regional transit system facilities across the region, such as Tacoma Dome Station, above.

As Sound Transit plans potential locations for rail stations and other facilities, evaluations of transit-oriented or joint development will occur at each location. Sustainable station development results from the combined efforts of local jurisdictions and public and private partners. Sound Transit will work with those parties and also evaluate which jurisdictions are encouraging appropriate land uses and densities to reinforce efficient land use and transit connectivity.

Approximately midpoint in the ST2 program implementation, or when the environmental review of all light rail extensions is substantially complete, Sound Transit will evaluate what projects might be funded through a new voter-approved ballot measure and consider a workplan and schedule for such a measure. Sound Transit staff will prepare an evaluation of further system expansion and submit it for Board consideration. This evaluation will at a minimum:

- Determine whether ST2 program implementation is on course as planned;
- Analyze the results of the planning studies to draw conclusions on the appropriateness of pursuing additional corridor development;
- Recommend corridors for additional high-capacity transit development; and
- Assess the potential tools available and/or necessary to develop financing strategies for such corridor development (for instance, federal or state grants, additional revenue authority, use of existing revenues or other funding partnerships), along with associated risks and opportunities.

Managing the existing system

System Access Program

Convenient and efficient access for customers using the system is critical to the effectiveness of the regional transit system and for expanding system ridership. A System Access Program is established to promote the development of facilities to improve connections between surrounding communities and stations, transit centers and other customer boarding locations.

The System Access Program aims to leverage existing or planned investments at or near these facilities. For example, in order to improve bicycle and pedestrian access, funds from this program could be matched with funds from other parties to connect a station to the regional trail system. Candidates for application of the program include the Tukwila/International Boulevard and Sea-Tac

International Airport stations, where trails and bicycle lanes lie to the east and west. A new trail extension is planned to the west, but additional facilities are needed to complete bicycle connections to the stations. Other potential System Access Program uses may include new and/or improved pedestrian and bicycle facilities, additional bus bays for expanding connecting bus service, capital improvements that improve bus speed and reliability along routes connecting to stations, and improved passenger drop-off/pick-up facilities at stations.

A portion of the program's funds will be allocated through a competitive process where project ideas will be regularly solicited and evaluated for funding consideration. Evaluation criteria will be established and may include, but are not limited to, the level of matching funds from outside sources, the ability to overcome small barriers or close small gaps that are present along pedestrian and bicycle routes, and the potential to reduce reliance on auto use and parking for station access.

Buses and ferries are an integral part of the rail expansion in ST2 by extending the reach of rail far beyond immediate station areas.

Bus/ferry-rail service integration

Buses and ferries are an integral part of the rail expansion in ST2. Sound Transit is working closely with its transit partners – Everett Transit, Community Transit, King County Metro, Pierce Transit and Washington State Ferries – to develop a coordinated bus/ferry-rail network that fully utilizes the unique qualities and strengths of all transit modes. By coordinating bus/ferry-rail service planning and by designing stations for efficient intermodal connections, the rail expansions proposed in ST2 can strengthen existing bus and ferry systems and achieve region-wide mobility benefits that extend far beyond the rail alignments.

Providing rail service in high-traffic areas allows buses to avoid congested segments of the roadway system, improving transit's on-time performance and efficiency. Convenient bus and ferry connections to rail stations extend the geographic reach of rail far beyond the immediate station areas, providing additional transit connections and expanded regional and neighborhood transit access to the high-capacity transit system. Since some bus service that operates parallel to rail will no longer be needed, the savings in bus service hours can be reinvested to increase bus service elsewhere.

Thousands of comments from community members helped shape the ST2 plan.

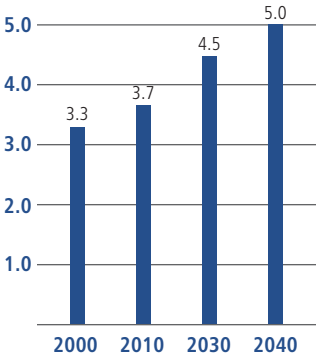
A community effort

The public played a key role in shaping Sound Transit's Long-Range Plan and ST2, and will play an even greater role in ST2's implementation.

Sound Transit will continue its open public involvement process with many opportunities to inform and involve the community. This is particularly important when planning, designing and constructing specific projects so that the unique character and needs of each community can be reflected in the finished project.

Regional population growth

Snohomish, King, Pierce and Kitsap counties (in millions)



Source: Puget Sound Regional Council

The Sound Transit District

The Sound Transit District is more than 1,000 square miles with a population of about 2.86 million people. There are currently more than 50 cities in the district, which includes most of the urban areas of King, Pierce and Snohomish counties.

Sound Transit is governed by an 18-member board of directors made up of local elected officials including mayors, city council members, county executives and county council members from within the Sound Transit District, and the Secretary of the Washington State Department of Transportation.

Annexations

After voters within the district boundaries have approved a ballot proposition authorizing local taxes to support implementation of the ST2 Plan, the Sound Transit Board may approve resolutions calling for elections to annex areas outside, but adjacent to, the Sound Transit District.

The legal requirements to annex areas into the Sound Transit District include the following:

The Sound Transit District

- Includes urbanized areas of Snohomish, King and Pierce counties
- 1,000 square miles
- 52 cities

The Sound Transit Board may call for annexation elections after consulting with any affected transit agencies and with the approval of the legislative authority of the city or town (if the area is incorporated) or with the approval of the area's county council (if it is unincorporated).

Citizens in areas to be annexed are provided an opportunity to vote on proposed annexation and imposition of taxes at rates already imposed within the Sound Transit District boundaries.

If approved by the voters, changes to the Sound Transit District boundaries may require changes in the make-up of the Sound Transit Board membership. Board membership must be "representative" of the proportion of the population from each county that falls within the Sound Transit District.

Extending service outside Sound Transit boundaries

Sound Transit may extend new services beyond its boundaries to make connections to significant regional destinations and allow areas outside of the district to function as part of the regional system.

Such service extension would require agreements with the affected local transit agency and/or other appropriate government agencies.

Sound Transit will enter into agreements with agencies beyond the district boundary to integrate fares. This will allow flexible transfers between various transit operators and prevent people who live outside the district from being penalized financially for making regional trips by transit instead of by automobile.

Benefits of the Plan

Transportation improvements are clearly linked to the growth, development, quality of life and economic vitality of a region. ST2 proposes a range of transit improvements building on the investments Sound Transit has already made, with major extensions of Link light rail to serve more of the Central Puget Sound region's urban centers, along with improvements in Sounder commuter rail and enhancements to ST Express bus services and facilities. These improvements add major new capacity in the region's most congested corridors to help serve the transportation demands of the people and businesses already here, as well as anticipated growth.

Transit investments create value within a community that goes beyond where or how many projects are built. Personal mobility, regional connections, the availability of transportation alternatives, and impacts on growth patterns, quality of life and the economic well-being of the region are all tangible outcomes that must be considered in deciding on transit investments.

The regional transit improvements included in ST2 will have many benefits for people throughout the Puget Sound region and will further the realization of the long-term growth management and quality of life goals embodied in Vision 2040, the Sound Transit Long-Range Plan and local land use policies. Some of those benefits are briefly described below, and in more detail in Appendix C.

Table 1: Regional transit ridership and transfer rate

	Existing in 2006	2030 without ST2	2030 with ST2
Daily			
Transit trips	329,000	482,000	544,000
Transit boardings	424,000	661,000	808,000
Annual			
Transit trips	98 million	145 million	165 million
Transit boardings	127 million	199 million	246 million
Percent using ST	12%	40%	65%
Transfer rate	1.29	1.37	1.49

Table 2: Summary of projected Sound Transit ridership by mode in 2030

	Annual riders	Daily riders
Link light rail	86.5 million	280,000
Tacoma Link	2 million	6,000
Sounder commuter rail	6.5 million	24,000
ST Express bus	14 million	48,000
Total	**109 million**	**358,000**

With the ST2 Plan, transit ridership in the region is projected to grow by more than 65 percent over 2006.

Transit ridership

By 2030, the completed projects in *Sound Move* and ST2, along with continued growth in people riding local buses, means that public transit in the Sound Transit District will be carrying an estimated 165 million trips a year, twice as many as in 1996. Over 100 million of these trips will be on Sound Transit. Most importantly, these new transit trips will be concentrated in the region's most congested corridors on bus routes and rail lines serving the region's densest downtowns and urban centers.

The most important measure of any transit investment is whether it attracts riders and serves them well. The most direct way to measure this factor is the number of people riding transit. With the ST2 Plan, transit ridership in the region is projected to grow by more than 65 percent over 2006.

Table 1 compares regional transit ridership in 2006 with ridership projections for 2030, with and without the ST2 investments.

Table 2 summarizes the daily and annual boardings projected for Link light rail, Sounder commuter rail and ST Express bus in 2030 with the ST2 Plan.

Transit reliability – that is, on-time performance – is ensured through exclusive rights-of-way that are completely free of delays from traffic congestion.

Transit capacity

The capacity of rail transit is a combination of the size of the vehicles and how frequently they run. As with highway capacity, the important measure for rail capacity is the maximum passenger carrying capacity during the peak period, when service is most in demand. This is usually referred to as "peak passengers per hour in the peak direction." Projected ridership for Link light rail in 2030, seven years after ST2 system build-out, shows it will have capacity to meet demand well into the future.

The per-hour and all-day passenger moving capacity of the ST2 light rail system is significant, especially compared to a roadway of similar width with mixed traffic.

The difference between the ultimate system capacity and the ridership forecast shortly after opening represents the excess capacity available to accommodate a large amount of future ridership demand in the decades after the system is built. **Table 3** presents the hourly passenger capacity of the ST2 light rail system at points in the system with varying frequencies of train service, at three different loading standards: all passengers seated, a comfortable level of standing passengers and a "crowded" load that might only be accommodated during peak times for short segments, such as a major event.

Table 3: Light rail system capacity (passengers per hour per direction)

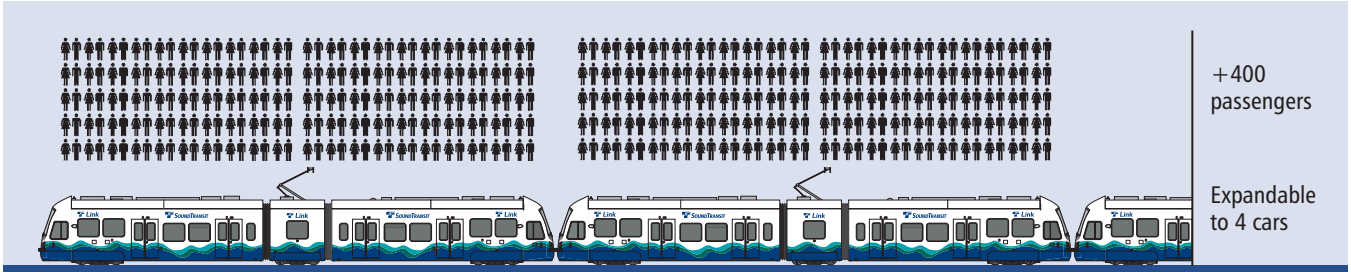
Peak frequency (minutes)	4-car trains per hour	Seated capacity (74 per car)	Comfortable capacity (150 per car)	Crowded capacity (200 per car)
2	30	8,880	18,000	24,000
4	15	4,440	9,000	12,000
6	10	2,960	6,000	8,000
8	7.5	2,220	4,500	6,000

Travel time savings and reliability

Within the Sound Transit District, bus travel times slow by about one percent per year, mostly due to increased road congestion and increased pedestrian activity in centers. Without improvements in transit, existing bus travel times would be expected to be about 22 percent slower by 2030.

Expanding the region's network of fixed guideway transit operating in its own right-of-way separate from roadway congestion helps protect transit riders from increasing travel times. Travel times for drivers will improve as more people get out of their cars and use transit, providing more room on the road.

As the region's population grows, Sound Transit can serve the rising demand by increasing the frequency and length of light rail trains. A four-car light rail train can carry up to 800 people. At maximum capacity, running four-car trains every four minutes offers the ability to move 12,000 riders per hour in each direction, or 24,000 riders per hour in both directions.



Light rail system capacity grows with demand

Tables 4 and 5 illustrate the expected travel time savings for the region's drivers and transit riders, achieved by the investments included in the ST2 Plan. Looking ahead to 2030, seven years after ST2 investments are complete, the region's highway drivers and transit riders are projected to save about 25 million and 19 million hours a year respectively.

Reliability means arriving at the same time every time, regardless of gridlock or weather conditions. Reliability is a critical factor in how people plan their travel and budget their time. Transportation system reliability has continued to decline in the Puget Sound region for several decades, both for car drivers and for transit riders. This is primarily related to increases in the severity of traffic congestion, and in the greater likelihood of congestion occurring at any time of day or on any day of the week.

When people need to arrive somewhere by a specified time, whether to be on time for work, or to catch a plane or to watch a child's soccer game, they know that if the trip involves one of the region's most congested corridors at peak hours they should allow a great deal of extra time to get there. Increasingly, the problem of congested peak hours has spread to all hours of the day and even to the weekends.

Buses are caught in the same traffic as cars and trucks. Freeway HOV facilities speed buses, but even these ramps and lanes often break down in the crush of peak period traffic, bad weather and accidents. Sounder commuter rail and Link light rail, although they share some grade crossings with vehicles, operate on their own rights-of-way free from conflicts with other traffic.

Reliability on streets and highways is affected by many things including accidents, stalled vehicles and weather conditions, but the most important factor in the Central Puget Sound region is the volume of traffic and delays caused by congestion.

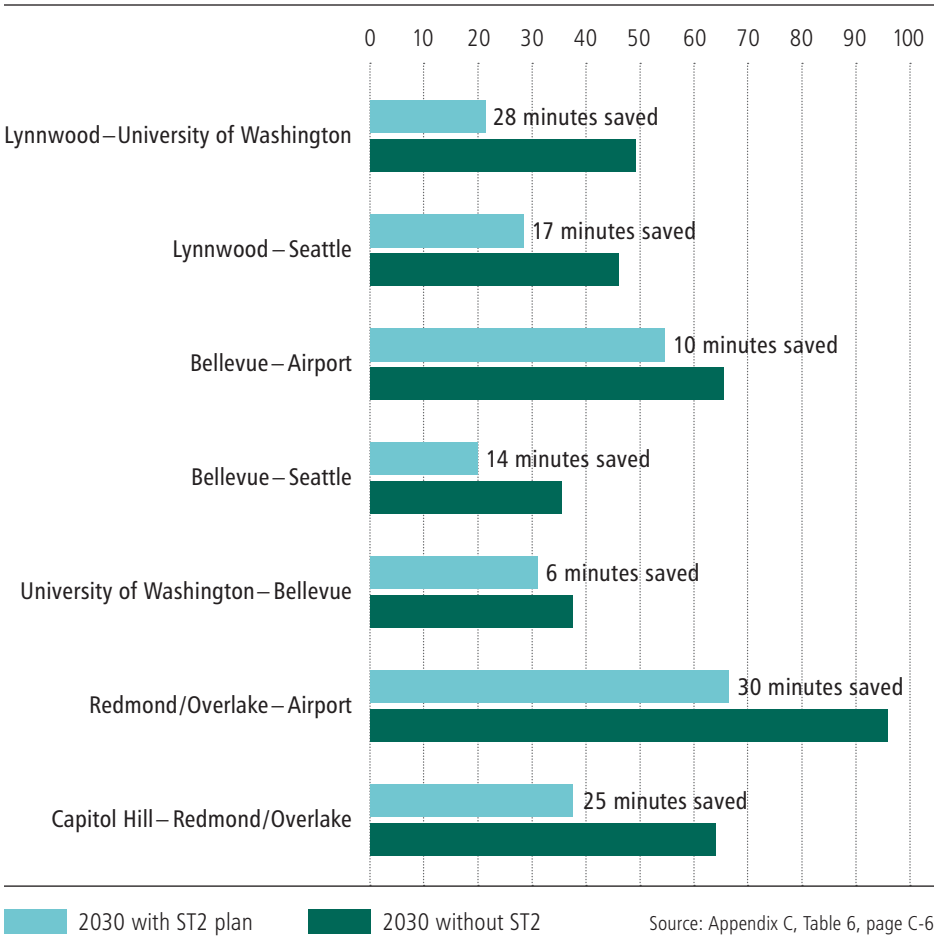
Table 4: Projected travel time savings for drivers and freight

	Drivers & freight 2030 with ST2
Reduction in annual vehicle miles traveled (switched to transit)	268 million
Annual highway delay reduced	25 million hours

Table 5: Projected travel time savings for transit riders

	Transit riders 2030 with ST2
Daily hours saved	60,000
Total annual hours saved	19 million

Projected average transit travel times



Source: Appendix C, Table 6, page C-6

Each year, rising congestion means drivers have to allow more and more time to reach their destinations. This is illustrated by the travel time allowances at right that are necessary to have a 95 percent chance of arriving on time.

WSDOT tracks reliability on the freeways for major commutes between pairs of cities, and calculates "95 percent reliable travel times." This is the amount of time a driver needs to plan for to arrive on time 19 times out of 20.

WSDOT data for major corridors shows reliability on the region's highways to be steadily declining. **Table 6** shows WSDOT's estimates of how much time a driver needs to allow for travel between certain points in the regional system due to the unpredictability of highway travel in the region.

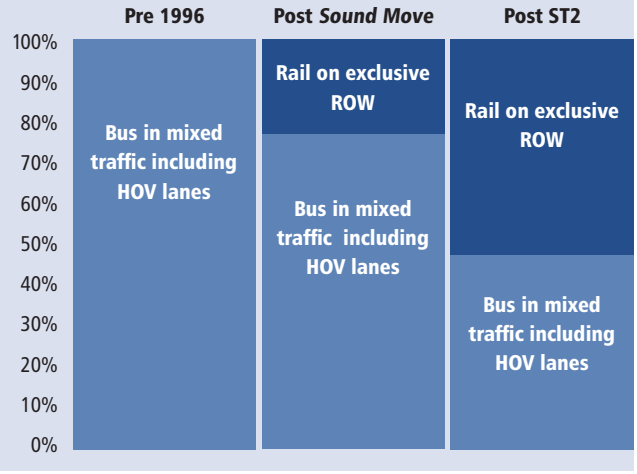
Transit reliability is related to a number of factors, but most significantly to the portion of the trip that occurs in exclusive right-of-way. **Figure 1** illustrates the increased access to exclusive right-of-way that will be experienced by the region's transit riders with ST2.

Table 6: Regional highway travel time reliability

Route description	Travel time at posted speeds	Average peak travel time	Travel time for 95% on-time arrival	On-time arrival % increase
From Seattle	(in minutes)	(in minutes)	(in minutes)	
Seattle–Everett	24	43	60	40%
Seattle–Redmond via SR 520	15	30	44	47%
Seattle–Bellevue via I-90	11	18	32	78%
Seattle–Bellevue via SR 520	10	21	32	52%
Seattle–Issaquah	16	23	37	61%
Seattle–SeaTac	13	19	28	47%
Seattle–Federal Way	22	37	56	52%
From Bellevue				
Bellevue–Everett	23	44	62	41%
Bellevue–Seattle via I-90	11	28	46	64%
Bellevue–Seattle via SR 520	10	26	38	46%
Bellevue–Tukwila	13	33	45	36%
From other locations				
Renton–Auburn via SR 167	10	20	33	65%

Source: WSDOT Gray Notebook: Measures, Markers, and Mileposts 9/30/07 p.68

Figure 1: Percentage of passenger miles in mixed traffic vs. exclusive right-of way



Transit reliability is related to the portion of the trip that occurs in exclusive right-of-way. As the percentage of rail trips increases, transit reliability will also increase.

Sound Transit's Link light rail operates entirely on exclusive right-of-way. In addition, most of the right-of-way is grade separated with no interference from traffic. Even where there is no grade separation, Link light rail operates in exclusive right-of-way with signal preemption. This allows the service to maintain a very high level of reliability at all times of the day.

Upon completion of the ST2 investments, the share of all transit riders in the region using Sound Transit's services grows from 12 percent today to 65 percent in 2030. Much of the bus service in new rail corridors can be reinvested elsewhere in the region, resulting in an overall increase in transit service and access beyond the rail lines.

Transit system accessibility

The reach of the regional transit investments made in *Sound Move* and in ST2 is much greater than just the immediate vicinity of rail stations and transit centers. **Figure 2** shows the access to the regional light rail and commuter rail systems when all ST2 improvements are in service. It depicts the geographic coverage of an average ½ mile walk access and average 2½ mile park-and-ride access to the rail stations, and the reach of existing local bus services (including an average ¼ mile walk distance to the bus) that would allow access to the rail system with one transfer. Within the Sound Transit District, over 70 percent of residents and over 85 percent of employees would have convenient access to the region's rail system in 2030.

Activity center drive-alone travel reductions

Table 7 on the following page presents the percentage of work and college trips made by transit riders to a selected set of regional centers. Increasing access to regional centers by transit reduces the need for automobiles that contribute to roadway congestion and delay, fuel consumption and air pollution, and use of scarce land resources for parking. The existing transit share data is from the 2000 U.S. Census Journey-to-Work survey as compiled by PSRC. Percentages include ridership on scheduled fixed-route transit service. Excluded are paratransit, dial-a-ride, carpools and vanpools.

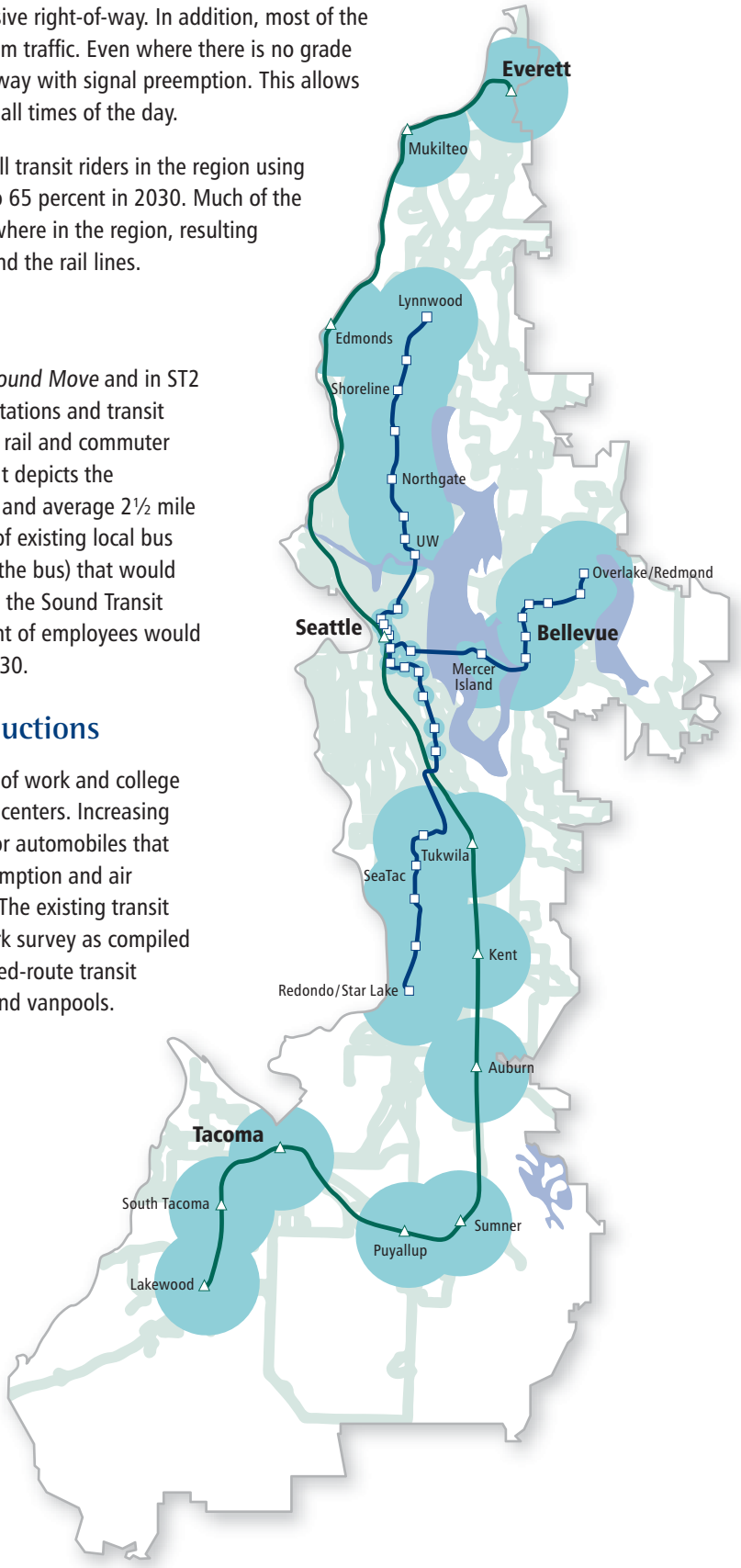


Figure 2: Combined regional rail acccess

As shown in the shaded areas, the ST2 rail investments would be accessible to 70 percent of the region's population and 85 percent of its jobs in 2030.

Note: This does not include areas served by ferries or bus routes that are outside the Sound Transit District.

Table 7: Projected activity center mode splits

	Existing transit share of commute trips	ST2 2030 share of commute trips
Northgate	6%	9%
University District	20%	33%
Downtown Bellevue	8%	12%
Downtown Seattle	40%	50%

Table 8: CO_2 equivalents (E) of ST2 emission reductions[1]

ST2 annual average emission reductions	
138,943 metric tons CO_2E	
which is equivalent to	
25,400	passenger vehicles;
323,100	barrels of oil consumed;
1,900	gasoline tanker trucks;
12,300	single-family homes;
1,000	acres of forest preserved;
700	railcars of coal; or
47,900	tons of landfill waste

[1] Source: EPA Clean Energy Calculations and References, http://www.epa.gov/cleanenergy/energy-resources/refs.html.

Vehicle miles traveled, fuel use and greenhouse gas reductions

New transit riders using the investments in the ST2 Plan will reduce daily vehicle miles traveled in the region by about 870,000 miles per day, or 268 million miles per year. That equates to annual fuel savings of about nine million gallons. Not burning that fuel would save the region about 360 metric tons of equivalent CO_2 emissions each day and approximately 100,000 tons per year in 2030. According to the federal Environmental Protection Agency, this level of emission reductions is equivalent to the emission production levels included in **Table 8**.

Transportation system cost and delay reductions

According to the U.S. Census Bureau, in 2003 the average family in our region spent 18 percent of disposable income on transportation, more than any other expenditure except housing. The average household has 2.3 people, owns 2.4 cars and spends $9,350 a year on transportation.

The most expensive costs of driving are owning and insuring a vehicle. A family that can own one less car because of better transit service can save thousands of dollars a year on transportation. A family that owns the same number of cars, but drives less will save on vehicle operating costs – gas, oil, parking, tires and maintenance. For example, based on current average vehicle fuel economy and fuel cost of about $4.00 per gallon, ST2 transit investments would save the region about $100,000 per day, or about $37 million per year.

For those commuting by transit to places with high parking costs, the savings in parking are substantial. For example, a monthly PugetPass good for unlimited $2.25 rides (the two-zone peak hour fare on King County Metro) costs $81. According to the PSRC, the average cost of parking in the region's downtowns in 2006 was $138 a month. For the average transit commuter to Downtown Seattle, savings in parking would be approximately $700 a year, on top of the savings on gas and other vehicle operating costs.

As important as out-of-pocket expenses, the ST2 investments would also save about 25 million hours of delay per year for drivers and freight, and 19 million hours per year for transit riders. Rather than sitting in traffic or slower transit, residents would be able to better use their time with their families or in productive work. Residents of the region would save over $600 million per year in today's dollars, based on an average value of time of about $14 per hour, about half the region's average wage rate.[2]

[2] Sound Transit, Draft Benefit-Cost Methodology Report, June 2008.

Because it runs on its own tracks separated from traffic, light rail is quick and reliable.

Paying for the System

Financial plan framework

State law provides the basis for funding regional transit investment through authorization of voter-approved taxes and bonding. The ST2 Plan will be funded by a combination of existing local taxes (four-tenths of one percent sales and use tax, three-tenths of one percent motor vehicle excise tax to be ended after 2028), new voter-approved local taxes (an additional five-tenths of one percent sales and use tax), federal grants and fares. Sound Transit will issue bonds backed by local tax collections within the Sound Transit District to help implement the ST2 Plan.

The agency will seek legislative authority to replace or substantially reduce its reliance on the sales and use tax as the primary funding source for regional transit improvements, consistent with all contractual commitments. In order to replace the revenue that would be lost by reducing or eliminating the sales and use tax, the agency will seek legislative authority to raise an equal amount of revenue from other sources more directly related to regional transportation such as tolls, user-based fees, vehicle or other transportation related taxes.

ST2 quickly expands ST Express bus and Sounder commuter rail while building out the regional light rail system.

Funding

The proposed plan is built on the following funding elements (all dollar values include inflation and represent year of expenditure dollars):

***Sound Move* surplus:** Revenue generated from Sound Transit's existing *Sound Move* taxes (four-tenths of one percent sales and use tax and three-tenths of one percent motor vehicle excise tax), will continue to be used in addition to grants, fares and other miscellaneous sources. The revenue generated from *Sound Move* surplus that is available to be applied to the ST2 program is estimated to be $2.3 billion.

ST2 sales and use tax: The plan will seek voter approval to raise the local sales and use tax an additional five-tenths of one percent. Revenue from the five-tenths of one percent sales and use tax increase is estimated to generate $7.8 billion through 2023.

ST2 rail investments result in an 8.9 percent rate of return to the region , paying for themselves in about a decade.

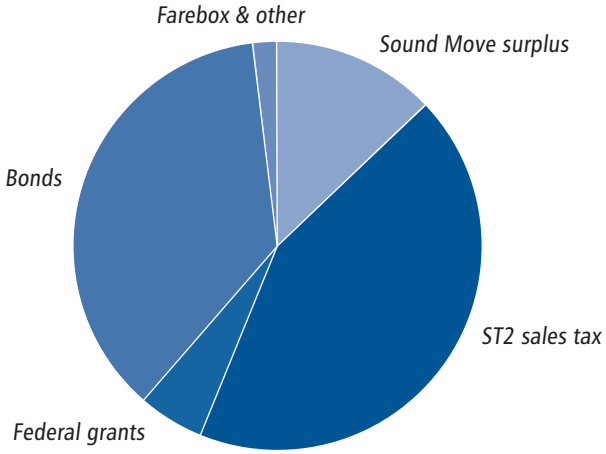
Federal support: The ST2 Plan assumes an additional $895 million in federal grants to build out the system, supplementing local resources. These federal grants for capital programs include Federal Transit Administration formula grants and full funding grant agreements. No state or local grants are assumed for implementing the ST2 Plan.

Bonding: Because transit facilities provide benefits over a long span of time, it is reasonable to finance a portion of their construction over a period that extends well beyond the construction timeframe. Sound Transit's debt financing capacity will be calculated by evaluating all revenues and deducting total operating expenses for net revenues available for debt service. The Sound Transit Board recognizes that its future bondholders will hold first claim against taxes pledged as repayment for outstanding bonds. The ST2 Plan includes an estimated $6.5 billion in bond financing from 2009-2023.

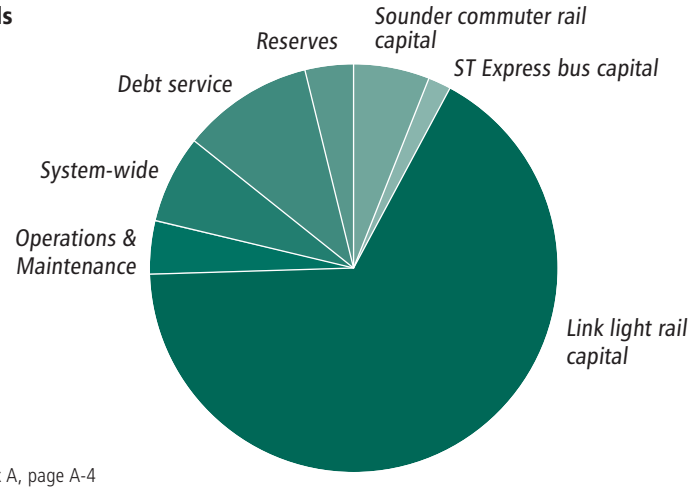
Fares: Sound Transit currently collects fare revenues from passengers using the system. As the ST2 system is built out, the agency will continue to collect fares and other operating revenue. The ST2 related fares and other operating revenues are estimated to be $219 million from 2009-2023.

Interest Earnings: The ST2 related interest earnings on net cash balances are estimated to be $143 million from 2009-2023. Financial policies attribute these revenues to fund system-wide costs.

Sources of funds



Uses of funds



Source: Appendix A, page A-4

Estimated costs

The ST2 Plan will cost an estimated $17.8 billion in capital and operating investments to expand the regional high-capacity transportation system – Link light rail, Sounder commuter rail, and ST Express bus service. The capital and other associated costs that would be incurred from 2009 through 2023 are as follows:

Sounder commuter rail: $1.1 billion for additional track space leases, locomotives and coach cars, maintenance facilities, and stations and improvements.

ST Express bus: $344 million for expanded park-and-rides, transit centers, station access improvements, bus fleet and maintenance facilities.

Link light rail: $11.8 billion for approximately 36 miles of light rail to extend service to Lynnwood, the Overlake Transit Center area of Redmond, and Redondo/Star Lake. The light rail cost estimate includes the First Hill streetcar connector, Tacoma Link extension partnership funds and the Eastside rail corridor partnership.

Transit operations and maintenance: $730 million through 2023 for new light rail, commuter rail and regional bus services. The ST2 Plan funds transit operations indefinitely. The costs estimated here are for the first 15 years of ST2 transit operations through 2023.

Sounder commuter rail service led the nation in ridership growth in the first quarter of 2008. Public input supports expansion of this popular service.

System-wide activities: $1.3 billion through 2023. ST2 will fund system-wide expenditures, including the agency's research and technology and fares programs, future phase planning, administration and other expenditures that are necessary to maintain and plan for regional transit consistent with the voter-approved system plan.

Debt service: $1.8 billion through 2023. In order to finance the plan, the ST2 Plan anticipates the issuance of 30-year bonds as necessary to maximize the financial capacity required to complete the plan. The $1.8 billion in debt service reflects costs for 2009-2023 for bonds issued for ST2 projects. Debt service will continue until the final bonds are retired.

Reserves: $708 million through 2023. The plan funds estimated bond reserves and a two month operations and maintenance reserve.

ST Express ridership grew by 14 percent in the first half of 2008. ST2 expands this service in the highest need corridors by up to 30% starting in 2009.

Table 9: Uses of funds*

Uses of funds	
Capital expenditures	
Sounder commuter rail	1,101
ST Express bus	344
Link light rail	11,821
System-wide activities	153
Total capital	**13,418**
O&M expenditures	
Sounder commuter rail	206
ST Express bus	232
Link light rail	292
System-wide activities	1,141
Total O&M	**1,871**
Other	
Debt service	1,835
Contributions to reserves	708
Contribution to system-wide	
Total uses	**17,832**

Table 10: Sources of funds*

Sources of funds	
Sound Move taxes	2,301
ST2 sales & use tax	7,752
Federal grants	895
Bonds	6,522
Fares & other operating revenues	219
Interest	143
Total sources	**17,832**

* All figures in millions of year-of-expenditure dollars (2009-2023, includes inflation).
Figures may not add exactly due to rounding.

Project scope and betterment control: One tool that Sound Transit has at its disposal to constrain unanticipated growth in the costs of projects during their implementation is a Board-adopted Scope Control Policy. The objective of the policy is to guide staff in responding to requests for enhancements to projects that increase scope, usually with a corresponding increase in costs. The policy requires:

- Written project scope definitions at every stage of project development;
- Cost estimates and budgets that correspond directly to the project scopes;
- Consideration of project alternatives that are within the project budgets;
- Inclusion of reasonable and responsible mitigation measures based on specific, significant adverse environmental impacts clearly identified in environmental documents, and which are attributable to those impacts;
- Baselining of the project scope, mitigation measures and budget following the Board's decision at the conclusion of the environmental process;
- Confirmation and re-alignment of project scope and budget at each major project development milestone (e.g., completion of preliminary engineering);
- Addition of partner-financed enhancements to the baseline scope, provided the addition does not negatively affect Sound Transit's project scope, schedule and budget; and
- Project budgets can be increased to incorporate enhancements above and beyond the baseline scope only through a two-thirds majority vote of the Sound Transit Board.

The capital cost estimates for the ST2 Plan were developed using standard cost-estimating techniques common in the transit industry and recommended by the Federal Transit Administration. They also reflect Sound Transit's experience in designing and building comparable facilities in the Central Puget Sound region. Sound Transit's cost estimating methods were reviewed by an independent Expert Review Panel that was appointed by the State of Washington. **Table 9** summarizes the estimated cost of building out the ST2 system and operating and maintaining all of the services contained in the ST2 Plan.

Table 10 summarizes the revenues that are anticipated to be used to pay for the ST2 Plan.

For a more detailed sources and uses of funds summary – including explanatory notes and distribution of sources and uses by subarea – see Appendix A.

The Puget Sound region is a dynamic economic engine that would benefit from reliable, safe and sustainable transit investment to maintain its vitality well into the future.

Risk assessment

Building a complex regional transit system over an extended period involves risk. Those risks and Sound Transit's approach to addressing them are summarized below.

Tax base growth risks: The plan requires projections of revenue collections over an extended period. The agency relies on an independent revenue forecast that has been reviewed by the State's Expert Review Panel. That forecast projects sales tax revenues to grow at 4.76 percent annually from 2009-2023, compared to a 6.4 percent annual growth from 1980-2005.

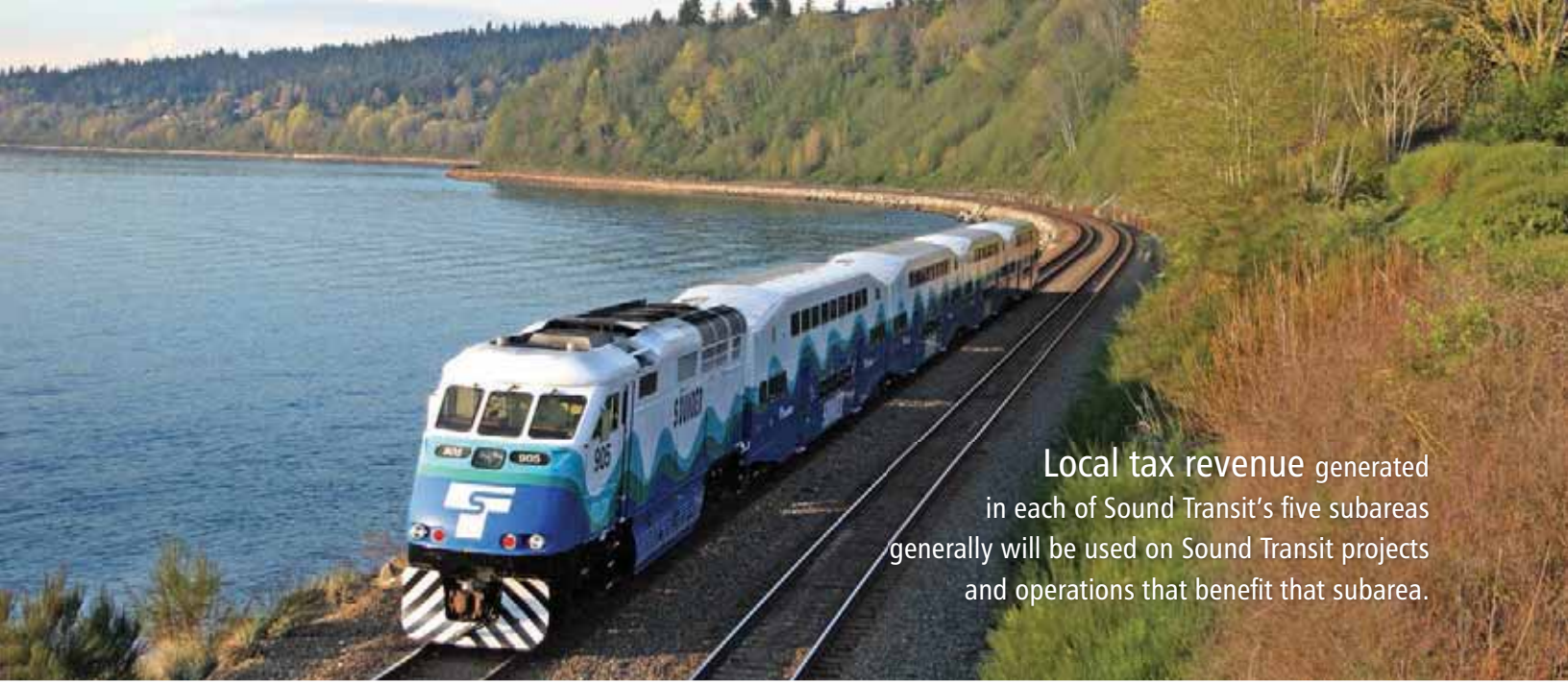
Federal funds risk: The ST2 financial plan assumes $895 million in federal funds. This assumption is based on an overall seven percent federal share of the ST2 capital program, compared with a 31 percent share for *Sound Move*. However, federal funds are contingent upon future Congressional authorization and may vary from initial ST2 projections due to federal fiscal conditions, timing of ST2 projects and competition from other transportation projects nationwide.

The ST2 Plan includes contingencies within the project budgets that allow for uncertainties and unforeseen conditions that arise during the design and construction of the projects.

Costs risks: With the exception of the light rail extension from the University of Washington to Northgate, ST2 is based on conceptual engineering estimates. The risks for costs to grow beyond initial estimates include: faster than anticipated growth in construction costs; faster than anticipated growth in real estate values; the addition of new required elements or projects not currently included in the plan; and more expensive alignments or station locations than included in the plan. The Sound Transit Board will closely monitor and manage project scope and cost risks to minimize cost increases. In addition, the ST2 Plan includes contingencies within the project budgets that allow for uncertainties and unforeseen conditions that arise during the design and construction of the projects.

The ST2 financial plan also contains additional contingency to deal with revenue shortfalls or cost increases. The agency plans to maintain a 50 percent annual contingency (after payment of operating expense) above the amount necessary to pay debt service (1.5x net coverage policy). In the event that a subarea's revenues are insufficient to cover its costs, the agency's currently approved policies provide the Sound Transit Board with these options:

- Modify the scope of the projects;
- Use excess subarea financial capacity and/or inter-subarea loans;
- Extend the time to complete the system; or
- Seek legislative authorization and voter approval for additional resources.



Local tax revenue generated in each of Sound Transit's five subareas generally will be used on Sound Transit projects and operations that benefit that subarea.

Sounder commuter rail service between Everett and Seattle, with service to Mukilteo and Edmonds, runs along the shores of Puget Sound.

Financial policies

The ST2 financial plan is based on the following principles, which are documented in the agency's financial policies and included as Appendix B. The financial policies also reflect the framework for completing ST2 and provide tools for the Sound Transit Board to respond to future conditions. For more detailed revenue and expenditure information, see Appendix A.

Distributing revenues equitably: Local tax revenue generated in each of Sound Transit's five subareas generally will be used on Sound Transit projects and operations that benefit that subarea. Subareas may fund projects or services located outside of the geographic boundary of the subarea when the project benefits the residents and businesses of the funding subarea.

Financial management: To effectively manage voter-approved revenues and to efficiently manage the transit system, Sound Transit will maintain policies for debt and investment management, risk management, capital replacement, fares and operating expenses and grants management.

Public accountability: Sound Transit will hire independent auditors and appoint a citizen oversight committee to monitor Sound Transit performance in carrying out its public commitments.

Voter approval requirement: The Sound Transit Board recognizes that the taxes approved by voters are intended to implement the system and to provide permanent funding for future operations, maintenance, capital replacement and debt service for voter-approved projects, programs and services. The Board has the authority to fund those future costs through a continuation of the local taxes authorized by the voters. However, the Board pledges that after the voter-approved plan is completed, subsequent phase capital programs that continue local taxes at rates above those necessary to build, operate and maintain the system and retire outstanding debt, will require approval by a vote of the citizens within the Sound Transit District.

Sales tax rollback: Upon completion of the capital projects in ST2 and *Sound Move,* the Board will initiate steps to roll back the rate of sales tax collected by Sound Transit. Sound Transit will initiate an accelerated pay off schedule for any outstanding bonds whose retirement will not otherwise impair the ability to collect tax revenue and complete ST2 or *Sound Move*, or impair contractual obligations and bond covenants. Sound Transit will implement a sales tax rollback to a level necessary to pay the accelerated schedule for debt service on outstanding bonds, system operations and maintenance, fare integration, capital replacement and ongoing system-wide costs and reserves.

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SOUNDTRANSIT
RIDE THE WAVE

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SOUNDTRANSIT
RIDE THE WAVE



Appendix A:
Detailed Description of Facilities and Estimated Costs

Sound Transit 2

A Mass Transit Guide

The Regional Transit System Plan
for Central Puget Sound

July 2008

SOUNDTRANSIT
RIDE THE WAVE

Table of contents

Adopted by Sound Transit Board, 7/24/08

Link light rail • Sounder commuter rail • ST Express regional bus • Tacoma Link light rail

Easy connections to more places for more people.

—Sound Transit vision statement

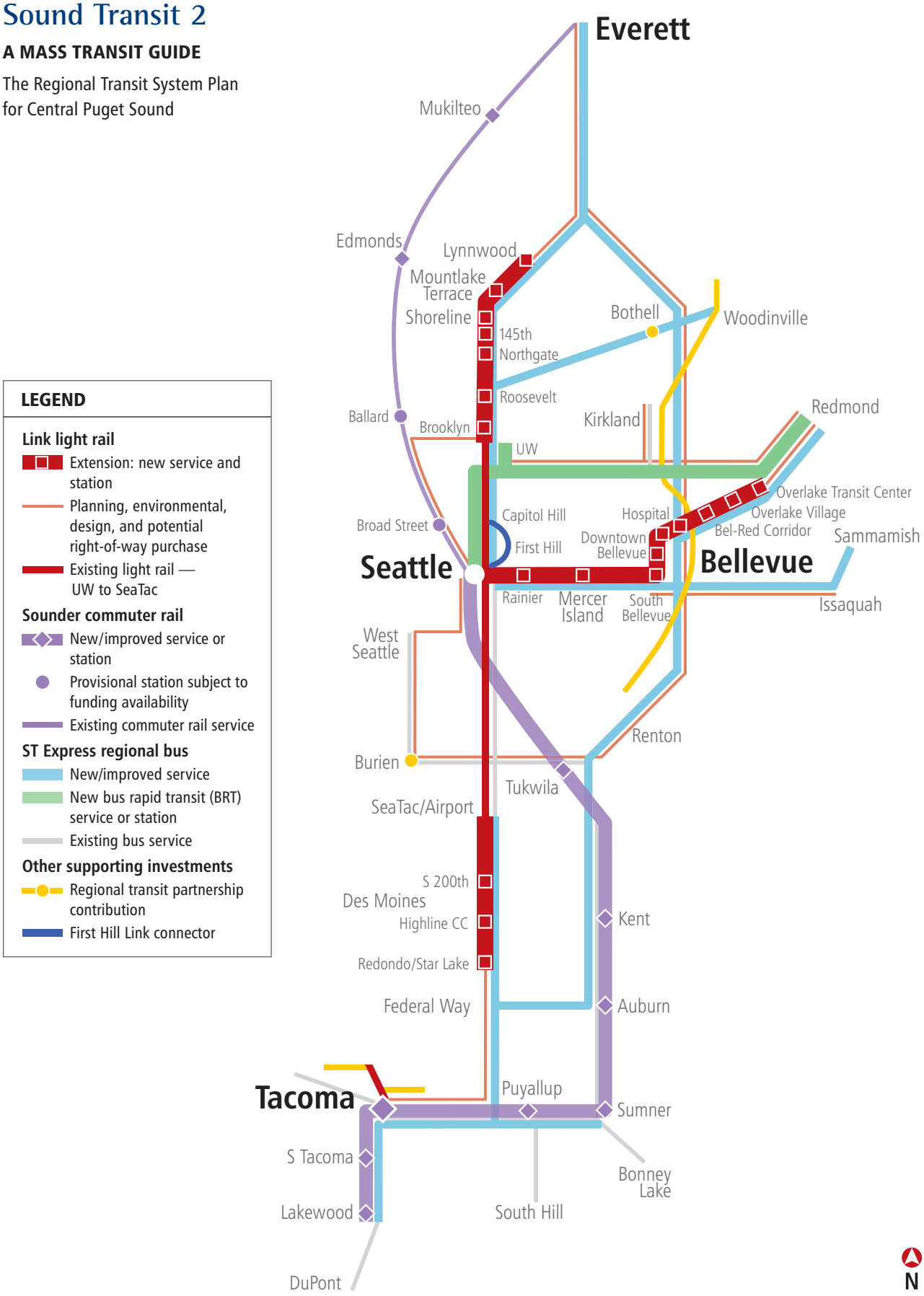
Sound Transit plans, builds, and operates regional transit systems and services to improve mobility for Central Puget Sound.

—Sound Transit mission statement

Sound Transit 2

A MASS TRANSIT GUIDE

The Regional Transit System Plan
for Central Puget Sound



Total agency

SUMMARY OF ESTIMATED ST2 PROGRAM COSTS AND REVENUES

(Millions of year-of-expenditure dollars)*

Projects

SOUNDER COMMUTER RAIL

- Permanent stations at Edmonds and Tukwila
- Station access projects at Mukilteo, Auburn, Sumner, Puyallup, Tacoma, South Tacoma and Lakewood
- 8-car platform extensions – Sounder South
- Expanded service and fleet – Sounder South
- Track and structure upgrades in Tacoma
- Yard and shops facility

	CAPITAL	O&M	TOTAL
Total costs	1,101	206	1,307

ST EXPRESS BUS

- Approximately 100,000 additional ongoing annual service hours beginning in 2009
- Operating savings from service reinvestment in response to Link light rail operation
- Bus fleet expansion
- Bus maintenance capacity expansion
- Contribution to Bothell and Burien parking/transit facilities

	CAPITAL	O&M	TOTAL
Total costs	344	232	576

LINK LIGHT RAIL AND OTHER

- North corridor extension from University of Washington to Lynnwood
- East corridor extension from International District to Overlake Transit Center
- South corridor extension from SeaTac/Airport to Redondo/ Star Lake
- Fleet, maintenance facilities and annual operation
- Contribution to First Hill Link Connector
- Contribution to Tacoma Link expansion
- Contribution to passenger rail partnership on Eastside BNSF
- Environmental review and preliminary engineering from Redondo/Star Lake to Tacoma
- Right-of-way preservation: Redondo/Star Lake to Tacoma
- Environmental review and preliminary engineering from Overlake Transit Center to Downtown Redmond

	CAPITAL	O&M	TOTAL
Total costs	11,821	292	12,113

SYSTEM-WIDE ACTIVITIES

- Agency administration and insurance, ST3 planning, LRT and HCT planning studies, fare integration, research & technology

	CAPITAL	O&M	TOTAL
Total costs	153	1,141	1,294

Sources and uses of funds

SOURCES

Sound Move surplus	2,301
ST2 taxes	7,752
Federal grants	895
Bonds	6,522
Fares and other operating revenues	219
Interest earnings	143
Total sources	17,832

USES

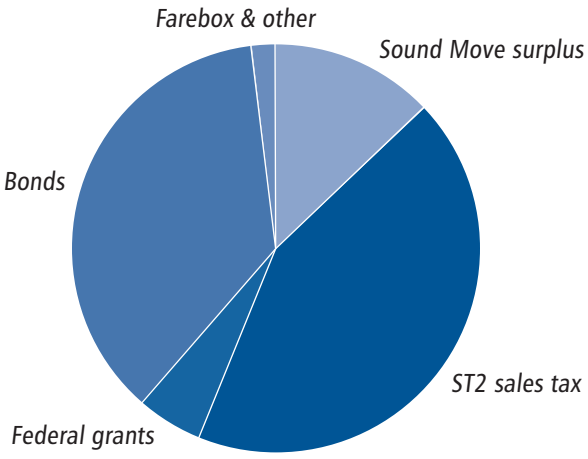
Sounder commuter rail capital	1,101
ST Express bus capital	344
Link light rail capital	11,821
System-wide capital	153
Sounder commuter rail O&M	206
ST Express bus O&M	232
Link light rail O&M	292
System-wide O&M	1,141
Debt service	1,835
Contribution to reserves	708
Total uses	17,832

*2009-2023, includes inflation.
Note: Columns/rows may not add exactly due to rounding.

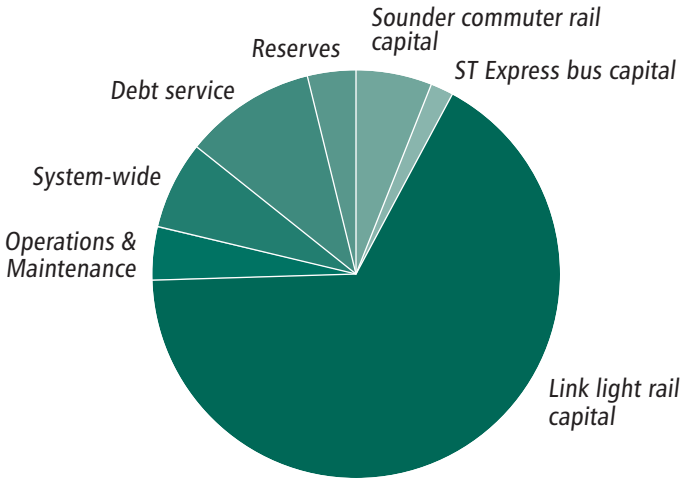
TOTAL SOURCES/USES OF FUNDS – $17,832

(Millions of year-of-expenditure dollars)*

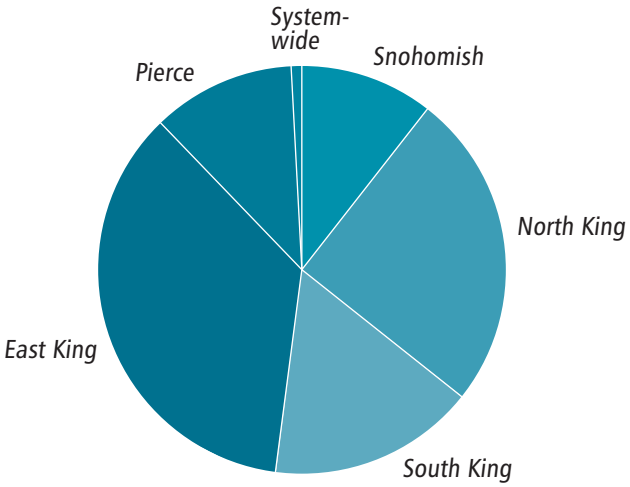
SOURCES OF FUNDS



USES OF FUNDS



SOURCES/USES BY SUBAREA



*2009-2023, includes inflation.

Financial plan

SOURCES & USES SUMMARY FOR ST2

(Millions of year-of-expenditure dollars)*

Sources of funds

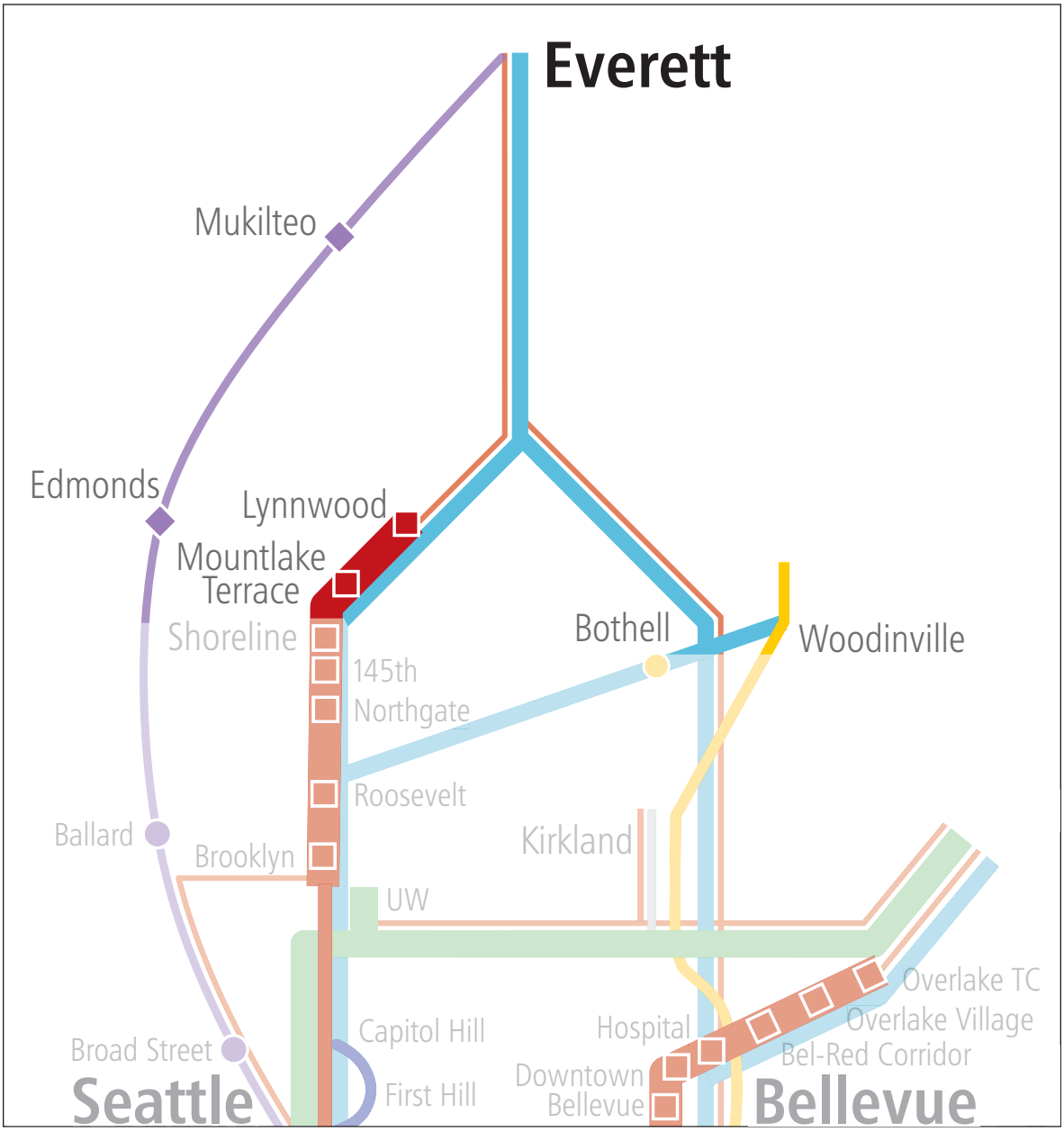
Notes		Snohomish	North King	South King	East King	Pierce	System-wide	Total
1	*Sound Move* surplus	463	110	69	1,271	387		2,301
2	ST2 taxes	977	2,079	1,374	2,045	1,278		7,752
3	Federal grants	57	481	81	203	74		895
4	Bonds	437	1,689	1,361	2,801	234		6,522
5	Fares & other operating revenues	21	60	19	39	80		219
6	Interest						143	143
	TOTAL SOURCES	**1,955**	**4,420**	**2,903**	**6,359**	**2,053**	**143**	**17,832**

Uses of funds

Notes		Snohomish	North King	South King	East King	Pierce	System-wide	Total
Capital expenditures								
7	Sounder commuter rail	93		121		887		1,101
8	ST Express bus	58		110	119	58		344
9	Link light rail	1,473	3,453	2,061	4,568	265		11,821
10	System-wide						153	153
	Total Capital	**1,623**	**3,453**	**2,292**	**4,687**	**1,210**	**153**	**13,418**
Operations & maintenance expenditures								
11	Sounder commuter rail	1		4		202		206
12	ST Express bus	77		27	83	45		232
13	Link light rail	32	116	31	113			292
14	System-wide						1,141	1,141
	Total O&M	**110**	**116**	**62**	**196**	**247**	**1,141**	**1,871**
Other								
15	Debt service	31	415	238	786	366		1,835
16	Contribution to reserves	46	127	108	386	40		708
17	Contribution to system-wide	145	308	204	303	190	(1,150)	
	TOTAL USES	**1,955**	**4,420**	**2,903**	**6,359**	**2,053**	**143**	**17,832**

*2009-2023, includes inflation.
Note: Columns/rows may not add exactly due to rounding.
See page A-16 for notes to line items.

Snohomish County subarea



LEGEND

Link light rail
- Extension: new service and station
- Planning, environmental, design, and potential right-of-way purchase
- Existing light rail — UW to SeaTac

Sounder commuter rail
- New/improved service or station
- Provisional station subject to funding availability
- Existing commuter rail service

ST Express regional bus
- New/improved service
- New bus rapid transit (BRT) service or station
- Existing bus service

Other supporting investments
- Regional transit partnership contribution
- First Hill Link connector

Snohomish County subarea

SUMMARY OF ESTIMATED ST2 PROGRAM COSTS AND REVENUES

(Millions of year-of-expenditure dollars)*

Projects

SOUNDER COMMUTER RAIL

- Mukilteo Station access project
- Permanent Edmonds Station
- Yard and shops facility contribution

	CAPITAL	O&M	TOTAL
Total costs	93	1	94

ST EXPRESS BUS

- Approximately 29,000 additional ongoing annual service hours
- Operating savings in response to Link light rail operation
- Contribution to bus fleet expansion
- Contribution to bus maintenance capacity expansion

	CAPITAL	O&M	TOTAL
Total costs	58	77	135

LINK LIGHT RAIL AND OTHER

- Extension from N. 185th Street in Shoreline to Lynnwood with stations at Mountlake Terrace and Lynnwood Transit Center
- Contribution to system maintenance capacity, fleet and annual operation

	CAPITAL	O&M	TOTAL
Total costs	1,473	32	1,505

PLANNING FOR THE FUTURE

- Light rail planning study from Lynnwood to Everett

	CAPITAL	O&M	TOTAL
Included in system-wide costs			

Sources and uses of funds

SOURCES

Sound Move surplus	463
ST2 taxes	977
Federal grants	57
Bonds	437
Fares and other operating revenues	21
Total sources	1,955

USES

Sounder commuter rail capital	93
ST Express bus capital	58
Link light rail capital	1,473
Sounder commuter rail O&M	1
ST Express bus O&M	77
Link light rail O&M	32
Debt service	31
Contribution to reserves	46
Contribution to system-wide	145
Total uses	1,955

*2009-2023, includes inflation.
Note: Columns/rows may not add exactly due to rounding.

North King County subarea

LEGEND

Link light rail
- Extension: new service and station
- Planning, environmental, design, and potential right-of-way purchase
- Existing light rail — UW to SeaTac

Sounder commuter rail
- New/improved service or station
- Provisional station subject to funding availability
- Existing commuter rail service

ST Express regional bus
- New/improved service
- New bus rapid transit (BRT) service or station
- Existing bus service

Other supporting investments
- Regional transit partnership contribution
- First Hill Link connector

North King County subarea

SUMMARY OF ESTIMATED ST2 PROGRAM COSTS AND REVENUES

(Millions of year-of-expenditure dollars)*

Projects

SOUNDER COMMUTER RAIL

- Provisional stations: Ballard and Broad Street

LINK LIGHT RAIL AND OTHER

- Extension from University of Washington Station to N. 185th Street with stations at Brooklyn, Roosevelt, Northgate, 145th/Jackson Park and Shoreline
- Rainier Station
- Contribution to system maintenance capacity, fleet and annual operation
- Contribution to First Hill Link Connector

	CAPITAL	O&M	TOTAL
Total costs	3,453	116	3,569

PLANNING FOR THE FUTURE

- Light rail planning study from University District to Ballard to Downtown Seattle
- Light rail planning study from Burien to West Seattle to Downtown Seattle (with South King subarea)

	CAPITAL	O&M	TOTAL
Included in system-wide costs			

Sources and uses of funds

SOURCES

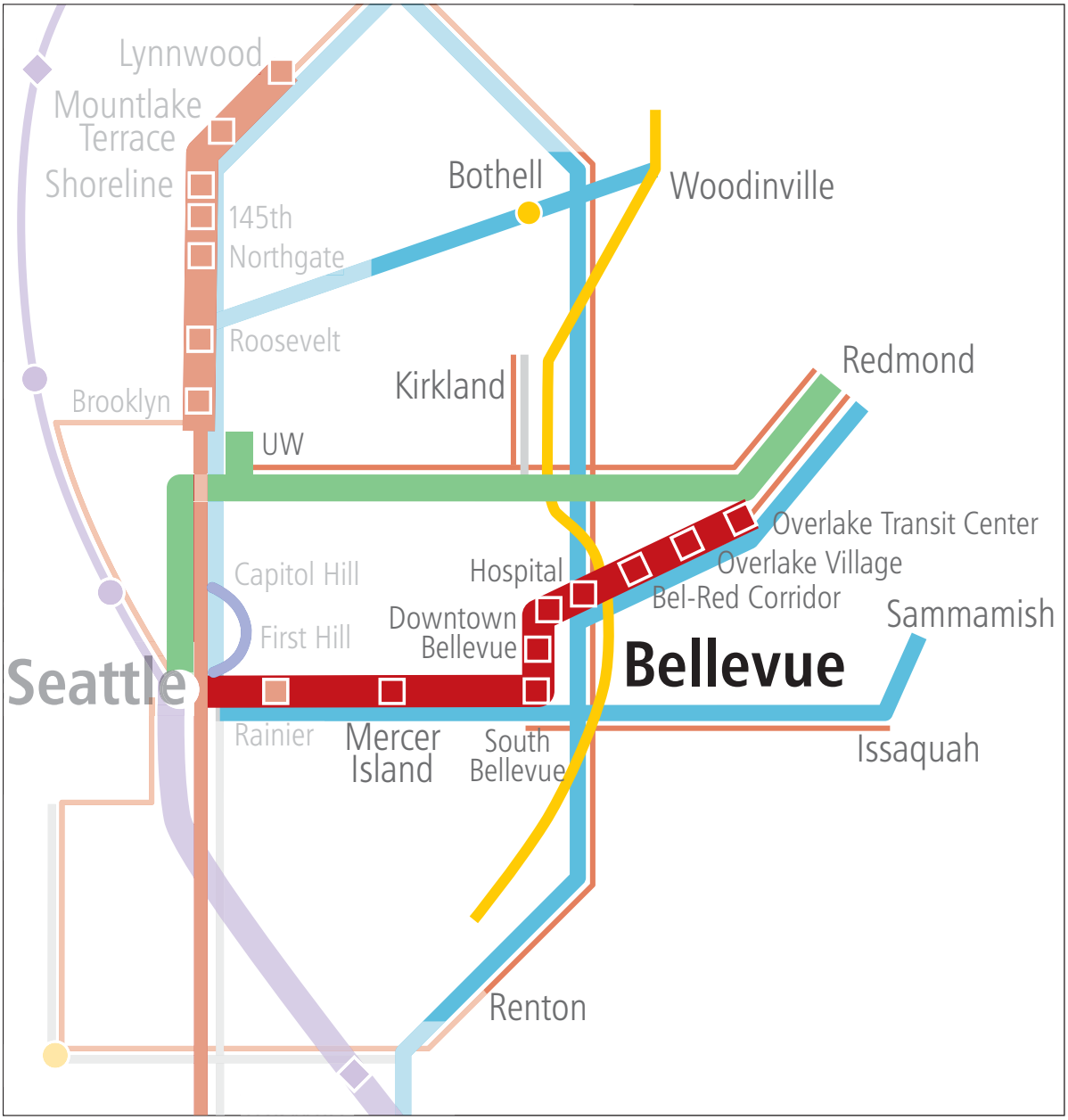
Sound Move surplus	110
ST2 taxes	2,079
Federal grants	481
Bonds	1,689
Fares and other operating revenues	60
Total sources	4,420

USES

Sounder commuter rail capital	
ST Express bus capital	
Link light rail capital	3,453
Sounder commuter rail O&M	
ST Express bus O&M	
Link light rail O&M	116
Debt service	415
Contribution to reserves	127
Contribution to system-wide	308
Total uses	4,420

*2009-2023, includes inflation.
Note: Columns/rows may not add exactly due to rounding.

East King County subarea



LEGEND

Link light rail
- Extension: new service and station
- Planning, environmental, design, and potential right-of-way purchase
- Existing light rail — UW to SeaTac

Sounder commuter rail
- New/improved service or station
- Provisional station subject to funding availability
- Existing commuter rail service

ST Express regional bus
- New/improved service
- New bus rapid transit (BRT) service or station
- Existing bus service

Other supporting investments
- Regional transit partnership contribution
- First Hill Link connector

East King County subarea

SUMMARY OF ESTIMATED ST2 PROGRAM COSTS AND REVENUES

(Millions of year-of-expenditure dollars)*

Projects

ST EXPRESS BUS

- Contribution to Bothell parking/transit facility
- Approximately 49,000 additional ongoing annual service hours
- Operating savings from service reinvestment in response to rail operation
- Contribution to bus fleet expansion
- Contribution to bus maintenance capacity expansion

	CAPITAL	O&M	TOTAL
Total costs	119	83	202

LINK LIGHT RAIL AND OTHER

- Extension from International District Station to Overlake Transit Center with stations at Mercer Island, South Bellevue, Downtown Bellevue, Overlake Hospital, the Bel-Red corridor, Overlake Village and Overlake Transit Center. Costs reflect an aerial alignment through Bellevue. The Sound Transit Board will select a preferred alternative after completing environmental review.
- Environmental review and preliminary engineering from Overlake Transit Center to Downtown Redmond
- Contribution to system maintenance capacity, fleet and annual operation
- Contribution to potential passenger rail partnership on the Eastside BNSF corridor, subject to completion of state-directed feasibility analysis and Sound Transit review and approval

	CAPITAL	O&M	TOTAL
Total costs	4,568	113	4,681

PLANNING FOR THE FUTURE

- Light rail planning study from Redmond to Kirkland to University of Washington in the SR 520 corridor
- Light rail planning study from South Bellevue to Issaquah
- Bus rapid transit planning study in the I-405 corridor

	CAPITAL	O&M	TOTAL
Included in system-wide costs			

Sources and uses of funds

SOURCES

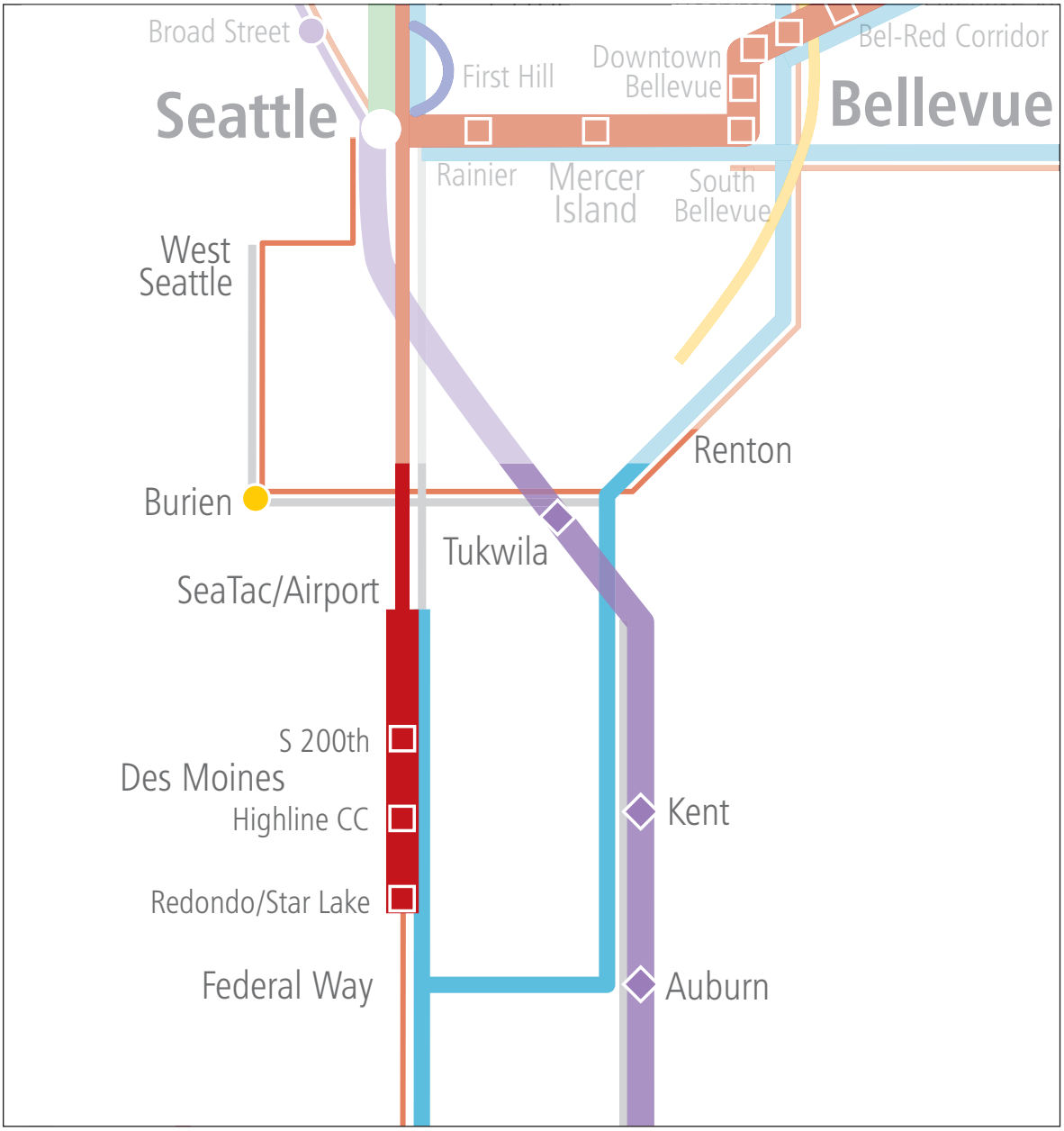
Sound Move surplus	1,271
ST2 taxes	2,045
Federal grants	203
Bonds	2,801
Fares and other operating revenues	39
Total sources	6,359

USES

Sounder commuter rail capital	
ST Express bus capital	119
Link light rail capital	4,568
Sounder commuter rail O&M	
ST Express bus O&M	83
Link light rail O&M	113
Debt service	786
Contribution to reserves	386
Contribution to system-wide	303
Total uses	6,359

*2009-2023, includes inflation.
Note: Columns/rows may not add exactly due to rounding.

South King County subarea



LEGEND

Link light rail
- Extension: new service and station
- Planning, environmental, design, and potential right-of-way purchase
- Existing light rail — UW to SeaTac

Sounder commuter rail
- New/improved service or station
- Provisional station subject to funding availability
- Existing commuter rail service

ST Express regional bus
- New/improved service
- New bus rapid transit (BRT) service or station
- Existing bus service

Other supporting investments
- Regional transit partnership contribution
- First Hill Link connector

South King County subarea

SUMMARY OF ESTIMATED ST2 PROGRAM COSTS AND REVENUES

(Millions of year-of-expenditure dollars)*

Projects

SOUNDER COMMUTER RAIL

- Permanent Tukwila Station
- Kent Station access project
- Auburn Station access project
- 8-car platform extensions

	CAPITAL	O&M	TOTAL
Total costs	121	4	125

ST EXPRESS BUS

- Contribution to Burien parking/transit facility
- Approximately 7,000 additional ongoing annual service hours
- Operating savings from service reinvestment in response to rail operation
- Contribution to bus fleet expansion
- Contribution to bus maintenance capacity expansion

	CAPITAL	O&M	TOTAL
Total costs	110	27	137

LINK LIGHT RAIL AND OTHER

- Extension from SeaTac/Airport Station to Redondo/Star Lake with stations at South 200th, Highline Community College and Redondo/Star Lake
- Contribution to system maintenance capacity, fleet and annual operation

	CAPITAL	O&M	TOTAL
Total costs	2,061	31	2,092

PLANNING FOR THE FUTURE

- Light rail planning study from Burien to West Seattle to Downtown Seattle (with North King subarea)
- Light rail planning study from Burien to Renton

	CAPITAL	O&M	TOTAL
Included in system-wide costs			

Sources and uses of funds

SOURCES

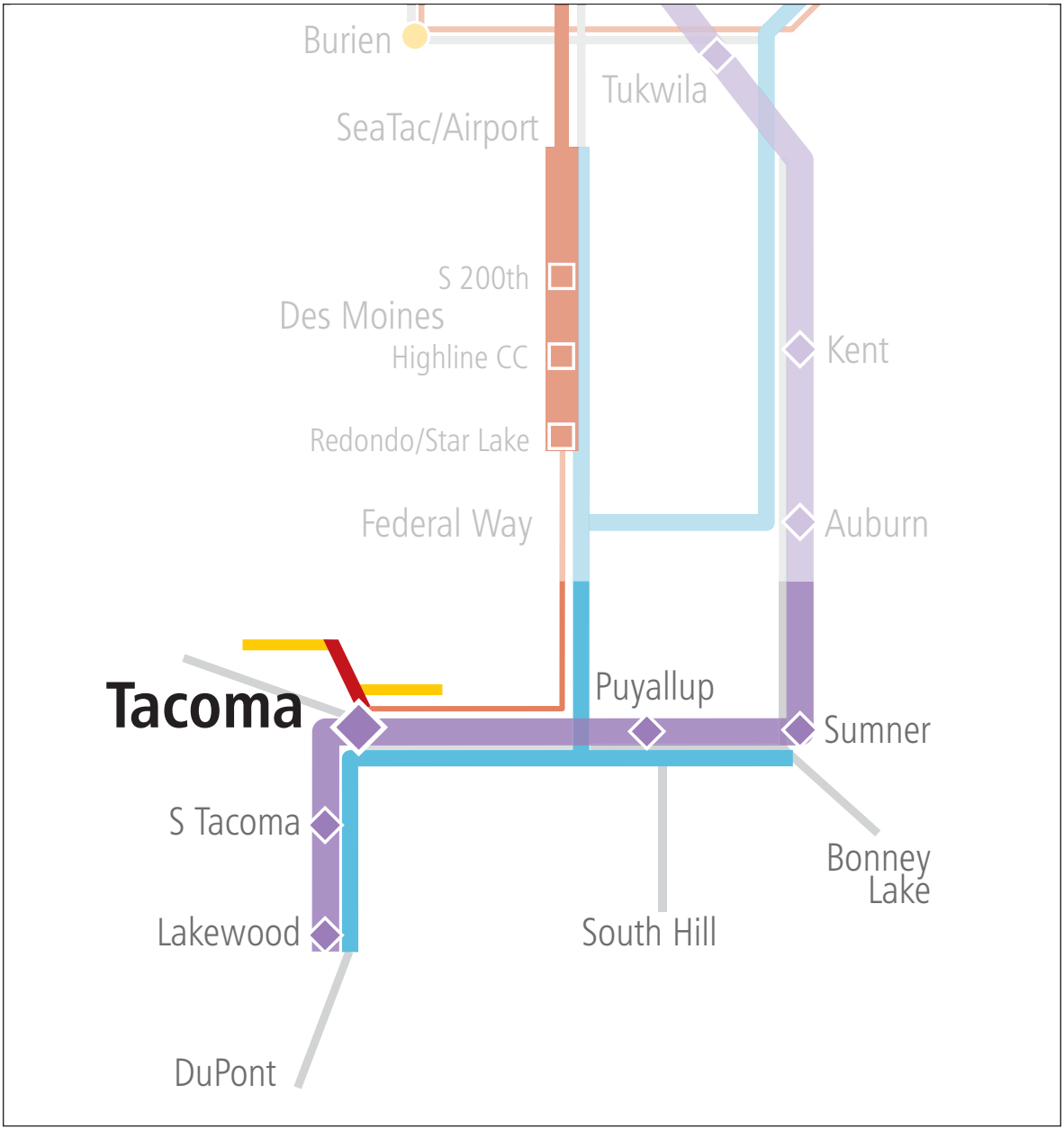
Sound Move surplus	69
ST2 taxes	1,374
Federal grants	81
Bonds	1,361
Fares and other operating revenues	19
Total sources	2,903

USES

Sounder commuter rail capital	121
ST Express bus capital	110
Link light rail capital	2,061
Sounder commuter rail O&M	4
ST Express bus O&M	27
Link light rail O&M	31
Debt service	238
Contribution to reserves	108
Contribution to system-wide	204
Total uses	2,903

*2009-2023, includes inflation.
Note: Columns/rows may not add exactly due to rounding.

Pierce County subarea



LEGEND

Link light rail
- Extension: new service and station
- Planning, environmental, design, and potential right-of-way purchase
- Existing light rail — UW to SeaTac

Sounder commuter rail
- New/improved service or station
- Provisional station subject to funding availability
- Existing commuter rail service

ST Express regional bus
- New/improved service
- New bus rapid transit (BRT) service or station
- Existing bus service

Other supporting investments
- Regional transit partnership contribution
- First Hill Link connector

Pierce County subarea

SUMMARY OF ESTIMATED ST2 PROGRAM COSTS AND REVENUES

(Millions of year-of-expenditure dollars)*

Projects

SOUNDER COMMUTER RAIL

- Expanded service and fleet
- Sumner Station access project
- Puyallup Station access project
- Tacoma Dome Station access project
- South Tacoma Station access project
- Lakewood Station access project
- Track and structure upgrades in Tacoma
- 8-car platform extensions
- Yard and shops facility contribution

	CAPITAL	O&M	TOTAL
Total costs	887	202	1,089

ST EXPRESS BUS

- Approximately 15,000 additional ongoing annual service hours
- Operating savings from service reinvestment in response to rail operation
- Contribution to bus fleet expansion
- Contribution to bus maintenance capacity expansion

	CAPITAL	O&M	TOTAL
Total costs	58	45	103

LINK LIGHT RAIL AND OTHER

- Environmental review and preliminary engineering from Redondo/Star Lake to Tacoma Dome
- Right-of-way preservation
- Contribution to Tacoma Link expansion
- Contribution to system maintenance capacity, fleet and annual operation

	CAPITAL	O&M	TOTAL
Total costs	265	0	265

Sources and uses of funds

SOURCES

Sound Move surplus	387
ST2 taxes	1,278
Federal grants	74
Bonds	234
Fares and other operating revenues	80
Total sources	2,053

USES

Sounder commuter rail capital	887
ST Express bus capital	58
Link light rail capital	265
Sounder commuter rail O&M	202
ST Express bus O&M	45
Link light rail O&M	
Debt service	366
Contribution to reserves	40
Contribution to system-wide	190
Total uses	2,053

*2009-2023, includes inflation.
Note: Columns/rows may not add exactly due to rounding.

System-wide activities

SUMMARY OF ESTIMATED ST2 PROGRAM COSTS AND REVENUES

(Millions of year-of-expenditure dollars)*

Projects

	CAPITAL	O&M	TOTAL
Fare integration		28	28
Research and technology		50	50
Insurance		94	94
ST3 planning		82	82
Agency administration	48	887	935
System Access Program	105		105
Total costs	153	1,141	1,294

Sources and uses of funds

SOURCES	
Sound Move surplus	
ST2 taxes	
Federal grants	
Bonds	
Fares and other operating revenues	
Interest earnings	143
Total sources	143

USES	
System-wide capital	153
System-wide O&M	1,141
Debt service	
Contribution to reserves	
Contribution to system-wide	(1,150)
Total uses	143

*2009-2023, includes inflation
Note: Columns/rows may not add exactly due to rounding.

NOTES TO FINANCIAL PLAN

(page A-5)

1 Revenues from *Sound Move* (taxes, grants, fares and other miscellaneous revenues) in excess of what is necessary to support *Sound Move* O&M and debt service.
2 Revenues from new ST2 0.5% sales and use tax increase.
3 Federal grants for ST2 capital programs (FTA formula and full funding grant agreements).
4 Estimated net issuance of bonds for ST2 capital projects (par less issuance costs).
5 Fares and other operating revenues from ST2 service.
6 Net interest on agency cash balances, attributed per financial policies first to fund system-wide costs.
7 Capital costs for expansion of the Sounder commuter rail system.
8 Capital costs for expansion of the ST Express bus system.
9 Capital costs for expansion of the Link light rail system.
10 Capital expenditures for system-wide activities (administration, System Access Program).
11 O&M costs for new service for the Sounder commuter rail system.
12 O&M costs for new service for the ST Express bus system.
13 O&M costs for new service for the Link light rail system.
14 O&M expenditures for system-wide activities (administration, fare integration, research and technology, insurance, ST3 planning).
15 Debt service (interest and principal) on bonds issued for ST2 capital projects.
16 Contribution to reserves (O&M, bonds, capital replacement and ending cash balances).
17 Contribution by subareas to system-wide costs.

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Appendix B:
Financial Policies

Sound Transit 2

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The Regional Transit System Plan
for Central Puget Sound

July 2008

SOUNDTRANSIT
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Link light rail • Sounder commuter rail • ST Express regional bus • Tacoma Link light rail

Easy connections to more places for more people.

—Sound Transit vision statement

Sound Transit plans, builds, and operates regional transit systems and services to improve mobility for Central Puget Sound.

—Sound Transit mission statement

Adopted by Sound Transit Board, 7/24/08

Sound Transit financial policies

The Sound Transit Board may amend these Financial Policies from time to time; the most current version of the Financial Policies is available at www.soundtransit.org.

As adopted May 31, 1996 (Resolution No. 72)
As amended April 13, 2006 (Resolution No. 72-1)
As amended May 24, 2007 (Resolution No. R2007-05)
As amended July 24, 2008 (Resolution No. R2008-10)*

PURPOSE

The Sound Transit Board (the Board) adopted an initial framework for the financing of *Sound Move,* by setting local tax rates, focusing on minimal debt financing, requiring conservative projections for federal and state funding, and establishing a definition by which equity will be measured. The Financial Policies reflect the Board's policy intent for implementing the financial framework for completing *Sound Move* and subsequent system plans and for providing the tools to the Board to appropriately manage toward and respond to future conditions.

LEGAL RESPONSIBILITIES

In adopting these Financial Policies, the Board recognizes certain legal responsibilities. Existing state law grants all legislative and policy authority to the Board, and does not allow the Board to abrogate, transfer or delegate such authority to other agencies or to the five subareas within the Sound Transit District. Consequently, all funds collected by or provided to Sound Transit, including local tax revenues, federal and other government grants, bond proceeds, farebox revenues, interest earnings, and private development revenues, may be disbursed only with approval of the Board. Priorities for disbursements will be determined within Sound Transit's annual budgetary process, which by law requires a two-thirds affirmative vote of the Board.

Similarly, the Board recognizes that bonds issued by Sound Transit will be secured by a pledge of repayment through local taxes. When the bonds are issued, Sound Transit will enter a binding contract with its bondholders that requires a first claim against local tax revenues for repayment. Stated differently, bondholders will have a legal priority to Sound Transit's local tax revenues, above and beyond any commitment Sound Transit may wish to make with its subareas that no subarea will pay another subarea's debt. Therefore, these Financial Policies reflect Sound Transit's commitment to subarea equity while maintaining the flexibility necessary to manage the financing of the System Plan on a consolidated basis and within legal constraints.

EQUITY

Definition of equity

Equity will be defined as utilizing local tax revenues for projects and services that provide transportation benefits to the residents and businesses in each of the subareas generally in proportion to the level of revenues each subarea generates. Subareas may fund projects or services located outside of the geographic subarea when the project substantially benefits the residents and businesses of the funding subarea. The Financial Plan for Sound Transit activities addresses this equity principle by providing a financial plan for each of the five Sound Transit subareas, comprised of the subarea's share of local taxes, bonding capacity, farebox proceeds and an assumption for federal funding. The five subareas are defined as Snohomish County, North King County/Seattle, East King County, South King County, and Pierce County. While the Financial Plan will be managed by the Board on a consolidated basis, the Board will report annually on individual subarea performance.

The Board agrees, therefore, that the facilities, projects and services identified in all voter-approved system plans represent a reasonable definition of equity for purposes of satisfying both public policy concerns and statutory requirements. The Financial Plan for voter-approved system plans will serve as the starting point for evaluating the equity principle.

IMPLEMENTATION POLICY

Subarea reporting

1. The Financial Plan will provide projections for each of the five subareas, comprised of the subarea's projected share of local taxes, use of bonds, farebox proceeds, an assumption for federal funding and related expenditures.

2. Local taxes will be allocated for subarea reporting based on actual tax receipts collected by subarea and within the Sound Transit District. The annual Financial Plan will incorporate updated forecasts based on these actual receipts. A portion of local taxes from each subarea will be allocated to fund system-wide costs as identified by the Board.

* Resolution No. R2008-10 provides that these amended Financial Policies take effect upon the earlier of either the approval of local funding for the Sound Transit 2 Plan by the voters at an election, or upon Board adoption of the amended Financial Policies by separate Resolution.

3. For subarea reporting purposes, government funding that is received for a specific project or service will be allocated to subarea(s) on a basis consistent with the allocation of costs for the project or service, unless the Board takes action to allocate the funds to other subareas as it deems in the best interest of Sound Transit after consideration of the funding needs to complete, enhance or extend the system plan.

   For subarea reporting purposes, government funding that is received that is agency-wide or general in scope will be allocated by the Board as it deems in the best interest of Sound Transit after consideration of the funding needs to complete, enhance or extend the system plan.

4. Miscellaneous revenues, such as those generated through public/private partnerships, advertising and terminal concessions will be allocated for subarea reporting based on subarea investment in the facility and/or service from which the revenue is generated.

5. Debt will be allocated for subarea reporting based on a subarea's share of total long-term bonding requirements or as otherwise directed by the Board as deemed in the best interest of Sound Transit.

6. Subarea expenditures will be allocated for subarea reporting based on facilities and services to be provided, their projected costs and project contingencies, associated operating costs, debt service, reserves for debt service, operations and maintenance and capital replacement. The allocation of expenditures for reporting purposes for facilities and services that cross subarea boundaries will be made by the Board to ensure safe and efficient operation of the system-wide facilities and services after due consideration to subarea benefits and priorities.

Monitoring function

1. Sound Transit will establish a system that on an annual basis reports subarea revenues and expenditures. This monitoring and reporting function will be incorporated into Sound Transit's financial cycle. The Board may at its discretion conduct an independent assessment of the consistency of subarea reporting with Board policy guidance.

2. Sound Transit will appoint an advisory citizen oversight committee to monitor Sound Transit performance under these policies (see Public Accountability, page B-4).

Adjustments to subarea projects and services

1. Subarea capital projects and transit services will be evaluated and adjusted annually as part of the Board's consideration and adoption of an annual budget which requires a two-thirds affirmative vote of the Board. Adjustments to subarea capital projects and services can include additional priority projects and/or services within that subarea should funding be available. This adjustment process recognizes that some fluctuation in revenues and expenditures against forecasts will occur.

2. For those cases where a subarea's actual and projected expenditures exceed its actual and projected revenues and funding sources by five percent or greater, and/or where unforeseen circumstances occur which would result in an inability to substantially complete projects within such subarea's plan, the Board shall take one or more of the following actions:
   - Correct the shortfall through use of such subarea's uncommitted funds and/or bond capacity which is available to the subarea; and/or
   - Scale back the subarea plan or projects within the plan to match a revised budget; and/or
   - Extend the time period of completion of the subarea plan; and/or
   - Seek legislative authorization and voter approval for additional resources.

3. For those cases where a subarea's actual and projected revenue to be collected until the system plan is completed will exceed its actual and projected expenditures by five percent or greater, and/or where unforeseen circumstances occur which would result in the subarea's ability to fund additional projects and services not identified in the System Plan, then Sound Transit may use such surplus funds to complete, extend or enhance the System Plan to provide transportation benefits for the subarea's residents or businesses as determined by the Board.

4. Contributions from other parties, including the State, local governments and private sector can be programmed by the Board to complete, extend or enhance the System Plan, consistent with agreements with the other party.

SYSTEM-WIDE EXPENDITURES

The Board shall fund such system-wide expenditures as necessary to maintain and plan for an integrated regional transit system consistent with voter-approved system plans. Such system-wide expenditures shall include fare integration, research and technology programs, future phase planning and agency administration and other such expenditures as determined by the Board to be appropriate. Properties authorized for purchase by the Board to preserve required right-of-way will be funded as a system-wide cost until such time as the right-of-way is utilized by a subarea(s), at which time the cost will be allocated to the subarea(s) consistent with Board approved allocation. System-wide expenditures, not funded by dedicated system-wide agency interest earnings, revenues or other specific funding sources, shall be allocated to subareas proportional to the subarea's share of total local tax revenues, population, benefits received, or on another basis as deemed appropriate by the Board.

DEBT MANAGEMENT

Legal definition of Sound Transit debt financing capacity

Sound Transit's enabling legislation defines Sound Transit's capacity for issuing general obligation debt at one and one-half percent of the value of the taxable property within the boundaries of the Sound Transit District (and with approval of three-fifths of voters voting within the Sound Transit District, up to five percent of the value of the taxable property within the district's boundaries). There is no dollar limit for revenue indebtedness.

Debt service coverage requirements

The Board recognizes that its future bondholders will hold first claim against taxes pledged as repayment for outstanding bonds. However, Sound Transit's debt financing capacity will be calculated on a more conservative basis, by evaluating all revenues and deducting total operating expenses for net revenues available for debt service.

For long-term planning purposes, Sound Transit agency debt service coverage ratio policy will be set at an average coverage ratio of 2.0x for net revenues over annual debt service costs, not to fall below 1.5x in any single year. However, as voter-approved plans are implemented, prudent changes to coverage ratios may be made by the Board as appropriate. Prior to bond issuance, Sound Transit will establish the appropriate debt service coverage ratio to incorporate into its bond covenants.

Uses of debt financing

1. Debt financing for capital projects covers two distinct types of borrowing, the first related to long-term debt financing, and the second related to short-term debt financing.

2. Short-term debt financing (with terms of ten years or less) is expected to be used primarily to bridge the gap between the necessary timing of expenditures and the anticipated receipt of revenues.

3. The use of long-term financing (with terms of more than 10 years) is expected to be limited to capital and related costs for portions of the program that have a useful life in excess of the term of the debt. Long-term financing should be preserved for those aspects of the program for which other sources of funds are not likely to be available.

Allocation of Sound Transit debt

1. For reporting purposes, the amount of long-term debt financing used to benefit each of the subareas will be based on each subarea's ability to repay debt after covering operating costs. The Board may determine appropriate debt service limits by subarea.

2. While the above policy prescribes the use of debt financing for subarea reporting, the Board will manage the agency's debt capacity on a consolidated basis so as to maximize resources between subareas.

SETTING PRIORITIES FOR EXPENDITURES

The Board will adopt expense budgets for transit operations and agency administration and maintain a multi-year capital improvement plan. A two-thirds affirmative vote of the Board is required for budget adoption. Sound Transit will establish guidelines for its budgeting process and criteria by which to establish priorities for expenditures.

FINANCIAL MANAGEMENT

Sound Transit shall maintain polices for debt and investment management, risk management, capital replacement, fares and operating expenses and grants management so as to effectively manage voter-approved revenues and efficiently operate the regional public transit system.

PUBLIC ACCOUNTABILITY

To ensure that the construction program development and implementation occurs within the framework and intent of these policies, Sound Transit will:

1. Conduct an annual independent audit of its financial statements in compliance with state and federal requirements;
2. Implement a performance audit program; and
3. Appoint and maintain an advisory citizen oversight committee, charged with an annual review of Sound Transit's performance and financial plan, for reporting and recommendations to the Board.

FUTURE PHASES

Voter approval requirement

The Board recognizes that the voter-approved taxes are intended to be used to implement the System Plan and to provide permanent funding for future operations, maintenance, capital replacement and debt service (permanent operations) for voter-approved programs and services. The Board has the authority to fund these future costs through a continuation of the local taxes authorized by the voters. However, as a part of its commitment to public accountability, the Board pledges that the local taxes will be rolled back to the level required for permanent operations and debt service after the voter-approved Sound Transit 2 (ST2) and *Sound Move* plans are completed and implemented. The rollback procedure is prescribed in the Tax Rate Rollback section. The Board further pledges that, after the voter-approved ST2 and *Sound Move* plans are completed, any subsequent phase capital programs that would continue local taxes after the System is completed at tax rates higher than necessary for permanent operations will require approval by a vote of those citizens within the Sound Transit District.

Tax rate rollback

When the voter-approved capital projects in ST2 and *Sound Move* are completed, the Board will initiate two steps to roll back the rate of sales tax collected by Sound Transit.

1. First, Sound Transit will initiate an accelerated pay off schedule for any outstanding bonds whose retirement will not otherwise impair the ability to collect tax revenues and complete ST2 or *Sound Move*, or impair contractual obligations and bond covenants. Sound Transit will implement a sales tax rollback to a level necessary to pay the accelerated schedule for debt service on outstanding bonds, system operations and maintenance, fare integration, capital replacement and ongoing system-wide costs and reserves.
2. Once all debt is retired, Sound Transit will implement a tax rollback to a level necessary to pay for system operations and maintenance, fare integration, capital replacement and ongoing system-wide costs and reserves.

Financial policies review

These Financial Policies may be amended from time to time as the Board deems necessary to implement and complete the System Plan. These policies, as they may be amended, will apply to future capital programs. The Financial Policies will be reviewed for applicability prior to any submittal of a future capital program to the Sound Transit District voters.

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SOUNDTRANSIT
RIDE THE WAVE

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RIDE THE WAVE

Appendix C:
Benefits, Costs, Revenues, Capacity and Reliability

Sound Transit 2

A Mass Transit Guide

The Regional Transit System Plan
for Central Puget Sound

July 2008

SOUNDTRANSIT
RIDE THE WAVE

Table of contents

Adopted by Sound Transit Board, 7/24/08

Link light rail • Sounder commuter rail • ST Express regional bus • Tacoma Link light rail

Easy connections to more places for more people.

—Sound Transit vision statement

Sound Transit plans, builds, and operates regional transit systems and services to improve mobility for Central Puget Sound.

—Sound Transit mission statement

Introduction

Voters in the Central Puget Sound region are being asked to make a major financial investment in transportation improvements proposed in the Sound Transit 2 Plan (ST2). This report provides the region's citizens with an assessment of various benefits the region can expect from the fully implemented ST2 Plan.

Transportation improvements are clearly linked to the growth, development, quality of life and economic vitality of a region. ST2 proposes a range of transit improvements building on the investments Sound Transit has already made, with major extensions of Link light rail to serve more of the Central Puget Sound region's urban centers, along with improvements in Sounder commuter rail and enhancements of ST Express bus. These improvements add major new capacity in the region's most congested corridors, to help serve the transportation demands of the people and businesses already here, as well as anticipated growth.

Since improved transportation is such an important part of maintaining the livability and vitality of the region – and because the ST2 Plan provides such a major extension of rail services throughout the region – this analysis goes a step beyond an ordinary approach to analyzing benefits.

In addition to looking at the travel benefits that can be thoroughly documented or conservatively projected, this report provides a broader discussion of the community and regional benefits that can be expected from the ST2 investment.

As with road and highway construction, transit investments create value within a community beyond where projects are built and how much concrete is poured. Personal mobility, regional connections, the availability of transportation alternatives, and impacts on growth patterns, quality of life and the economic wellbeing of the region are all tangible outcomes that must be considered in deciding on transit investments, as they typically are considered in decisions on road investments.

Table 1 shows a set of broad performance measures, some of which can be projected and measured, and others that are more difficult to quantify but which are important benefits of investing in transit infrastructure.

When the citizens of our region total both the direct and quantifiable benefits of transit investments, along with the indirect and qualitative benefits, and compare them to the costs of the plan, they will have the information necessary to make an informed decision. Already, the region is reaping the early benefits of the transit investments made as a part of *Sound Move*, Sound Transit's initial plan. Many benefits, however, such as the region's ability to achieve its land use vision and the shifting travel patterns that support dense, mixed-use development in walkable regional centers, will only be fully realized over the decades to come. Meanwhile, the direct and quantifiable benefits, such as more riders on transit, savings in travel time and travel costs, will continue to grow as more investments come on line and more people arrange where they live, work and shop, and how they travel, to take advantage of greatly expanded high-capacity transit options.

Data and methodology used to analyze direct benefits of the transportation improvements in ST2 have been prepared in accordance with nationally accepted standards and procedures, and have been subject to review by an independent Expert Review Panel appointed by and accountable to the state of Washington.

Table 1: Measures of performance by type

Transit measures	Other measures		
Transit ridership	Achievement of Vision 2040, the region's land-use plan	Permanent employment in operations and maintenance	Avoiding sprawl outside urban growth boundaries
Additional transit passenger trips	Development of dense, walkable urban centers	Increased rail freight mobility	Preserving rural and natural land
Time savings to transit riders in hours	New businesses attracted to the region	Attaining Commute Trip Reduction Act goals	Improved human health from increased walking and cycling
Value of travel time savings to transit riders in dollars	Increased economic activity	Vehicle miles reduced	Transportation benefits during special events (sports, fairs, etc.)
Subsidy per passenger trip and per passenger mile	Reduction in highway delay for private and commercial vehicles	Vehicle ownership and operating cost savings	Tourist spending
Farebox recovery ratios (operating revenue/operating expense)	Construction and related employment	Reduced parking demand and cost savings	
Transit system productivity		Improved connections between regional centers	
Transit system reliability			

Benefits of ST2 investments in the regional transit system

HIGHLIGHT **If the region's daily transit trips were all made by car, the line of cars would extend about 800 miles. The 2030 daily ridership represents a line of cars nearly 1,500 miles long.**

BACKGROUND

According to the Puget Sound Regional Council, between 1999 and 2005, transit ridership in the region grew over one and a half times as fast as daily vehicle miles traveled. These numbers cap a slow reversal of trends that started in the 1980s, when transit ridership could not keep pace with the explosive growth of travel by personal vehicle.

For a few years in the 1980s, as women entered the workforce in unprecedented numbers, employment in the region grew about twice as fast as population. At the same time, rising family incomes, the travel demands of two-worker families, and the continued patterns of suburban sprawl in the region fueled a growth in travel by personal vehicle that outpaced by four times the growth in population.

This imbalance, though somewhat less pronounced as the years passed, continued through the 1990s and became deeply embedded in people's expectations about traffic and gridlock, present and future. At the same time, even though transit ridership continued to grow, it did not keep pace with the overall increase in traffic.

Looking at the new century, transit ridership grew slightly in 2000 and 2001 but then, during the worst of the economic slowdown, actually declined in 2002 and 2003. As the economy picked up, however, people chose transit in increasing numbers and ridership rebounded sharply. At the same time, the trends of the previous decades reversed as more people decided to ride transit instead of drive.

In 1996, the year Sound Transit's *Sound Move* plan was approved by the voters, about 75 million individual trips were made on buses and trains in the Sound Transit service area. By 2006 that number had grown to 98 million trips.

By 2030, as a result of completed projects in *Sound Move* and ST2, along with continued growth in people riding local buses, public transit in the Sound Transit District will be carrying about 165 million trips a year, more than twice as many as in 1996.

Over 100 million of these trips will include Sound Transit. Most importantly, these new transit trips will be concentrated in the region's most congested corridors on bus routes and rail lines serving the region's densest downtowns and urban centers, adding critical capacity where it is most needed to support the region's economy and preserve its quality of life.

This section details the benefits to transit riders of ST2's major expansion in high-capacity transit throughout the region.

TRANSIT PASSENGER TRIPS

The most important measure of any transit investment is whether it attracts riders and serves them well. The most direct way to measure this factor is the number of people riding transit. With the ST2 Plan, transit ridership in the region is projected to grow by more than 60 percent over 2006.

Table 2 on the following page compares regional transit ridership today with ridership projections for 2030, with and without the ST2 investments.

Definitions

Transit passenger trips are counted with regard to *boardings, trips, transfers* and *passenger miles.* These terms are defined here.

- **Boardings** – Transit *boardings* are the number of times a passenger steps into any transit vehicle.
- **Transit trips (or passenger trips)** – *Trips* represent a completed journey made by a person from an origin to a destination (such as home to work). Because people may transfer from one route to another to complete such a journey, *trips* can consist of more than one transit *boarding*.
- **Transfer** – A *transfer* is when a passenger changes from one transit vehicle to another (bus-to-bus, or bus-to-train for example) to complete their trip. *Transfers* explain why the average transit trip consists of more than one *boarding,* and are a good measure of the effective integration of the individual routes that make up the overall transit system.
- **Transfer rate** – *Transfer rates* are an indication of how the individual elements of a transit system complement each other, that is how complete the coverage is, and the range of trips that can be made on the network. Nationwide and worldwide, higher *transfer rates* are strongly and positively correlated with higher transit ridership.

- **Passenger miles** – *Passenger miles* are a measure of service that a transit line, route or system is providing to its riders. For example, 100 passengers traveling ten miles each, results in 1,000 *passenger miles* of travel.

Table 2: Regional transit ridership and transfer rate

	Existing in 2006	2030 without ST2	2030 with ST2
Daily			
Transit trips	329,000	482,000	544,000
Transit boardings	424,000	661,000	808,000
Annual			
Transit trips	98 million	145 million	165 million
Transit boardings	127 million	199 million	246 million
Percent using Sound Transit	12%	40%	65%
Transfer rate*	1.29	1.37	1.49

*Transfer rate equals transit boardings divided by transit trips.

TRANSIT RIDERSHIP ON SOUND TRANSIT BY SERVICE TYPE

Table 3 summarizes the annual boardings and passenger miles projected for Link light rail, Sounder commuter rail and ST Express bus in 2030 with the ST2 Plan.

Table 3: Summary of projected Sound Transit ridership by mode in 2030

	Annual riders	Annual passenger miles
Link light rail	88.5 million	646 million
Sounder commuter rail	6.5 million	180 million
ST Express bus	14 million	164 million
Total	**109 million**	**990 million**

HIGHLIGHT In 2030, with the ST2 plan, the region's residents and visitors will travel nearly a billion miles a year on Link light rail, Sounder commuter rail and ST Express bus.

FORECAST METHODS

Sound Transit's ridership forecasts that form the basis for this report were prepared for the year 2030. The forecasts are based on:

- The Puget Sound Regional Council's adopted population and employment forecasts; and
- A well-documented modeling/forecasting methodology reviewed by local and national experts and approved by the Federal Transit Administration, specifically designed to avoid over-forecasts of transit ridership.

Sound Transit wants to ensure that its forecasts are appropriate and do not overstate system benefits. Accordingly, Sound Transit's forecasts do not consider other factors that have been shown to affect rail and overall transit ridership positively but which are not easily quantified. These include:

- **Rail bias** – *Rail bias* is the demonstrated willingness of people to make urban transit trips on trains that they would not make on equally fast buses. Researchers have documented this preference, and link it to passengers' perceptions of rail's speed and reliability, as well as a confidence factor related to the ease of understanding inherent in rail routes – passengers know trains can take them only where the tracks are laid and that if they go in the wrong direction backtracking is easy. Sound Transit's modeling does not take rail bias into account and assumes buses and trains with the same service characteristics would have the same ridership; and
- **Land use changes resulting from transit investments** – Sound Transit's modeling also does not assume that land use will change because of improvements in high-capacity transit. However, the experience of other cities confirms that rail, in particular, has the potential to shape land use both because of its ability to bring large numbers of people into dense urban centers without taking up the space required for freeways, streets and parking lots, and because developers have confidence in rail's permanence and so are willing to build their projects around rail stations.

The 2030 transit ridership forecast includes the effects of population and employment growth, and the transportation and transit projects included in the Puget Sound Regional Council's Metropolitan Transportation Plan. The ST2 projects assumed to be implemented by 2030 include:

- Light rail north from the University of Washington to Lynnwood, south from SeaTac to the Redondo/Star Lake area near Federal Way, and east to the Overlake Transit Center area of Redmond;
- Additional Sounder train service and capacity, including improved access at stations; and
- Additional ST Express bus service in all three counties on the most heavily used routes, plus redeployment of existing service as the rail system expands.

HIGHLIGHT **By 2030, the estimated combined annual travel time savings for drivers and transit riders is approximately 44 million hours.**

TRAVEL TIME SAVINGS

Table 4 and **Table 5** illustrate the expected travel time savings for the region's drivers and transit riders, achieved by the investments included in the ST2 plan.

Looking ahead to 2030, after ST2 investments are completed, the region's transit riders are projected to save 19 million hours a year.

This analysis is based on two scenarios for traffic in 2030: one with ST2 projects and one without ST2 projects. Accordingly, the numbers are estimates based on best practices. In the simplest terms, every car not driven because the driver chooses to travel by transit either reduces congestion or leaves space for another vehicle.

Table 4: Projected travel time savings for drivers and freight

	Drivers and freight 2030 with ST2
Reduction in annual vehicle miles traveled (switched to transit)	268 million
Annual highway delay reduced	25 million hours

Table 5: Projected travel time savings for transit riders

	Transit riders 2030 with ST2
Daily hours saved	60,000
Total annual hours saved	19 million

TRAVEL TIMES AND NUMBER OF TRANSFERS BETWEEN SELECTED CENTERS

Looking at specific trips between the region's centers is one way to understand how ST2 will benefit riders who are taking the bus today, as well as future riders who will be attracted to transit because of the improved speed and reliability they will experience on ST2 services.

Buses get slower every year: Within the Sound Transit District, bus travel times slow by about 1 percent per year, mostly due to more congestion on roads and increased pedestrian activity in centers. Without improvements in transit, therefore, existing bus travel times would be expected to be about 22 percent slower by 2030.

For example, the Bellevue-to-airport existing bus travel time is 53 minutes for ST Express Route 560 via I-405 and I-5. Without the light rail investment the bus travel time using Route 560 would be expected to increase from 53 minutes today to about 65 minutes by 2030. After light rail is extended across Lake Washington, however, the same trip is expected to take 55 minutes, with a transfer in Seattle. While that's two minutes longer than it takes today, it's a savings of 10 minutes over the time it would otherwise take to make the trip by bus in 2030.

Table 6 compares existing transit travel times to future transit travel times after implementation of ST2. The existing times are actual measured travel times, not the travel times shown on the bus schedules. Scheduled times cannot be relied on from hour to hour and day to day because of traffic congestion on the roads.

Shorter wait times are not included in travel time estimates shown in Table 6. These travel times *do not include* the effect of higher frequencies for rail systems. Typical light rail frequencies on all lines in 2030 will be at least every 10 minutes. Shorter wait times and transfer times also reduce total trip times for riders.

Table 6: Projected transit travel times and transfers between selected centers

	Existing transit time	Expected 2030 time without ST2*	2030 ST2 Plan time	Expected time savings
Lynnwood – University of Washington	39 min	49 min	21 min	28 min
Lynnwood – Seattle	42 min	45 min	28 min	17 min
Bellevue – Airport	53 min	65 min	55 min (1)	10 min
Bellevue – Seattle	31 min	34 min	20 min	14 min
University of Washington – Bellevue	32 min	37 min	31 min	6 min
Redmond/Overlake – Airport	80 min (1)	96 min (1)	66 min (1)	30 min
Capitol Hill – Redmond/Overlake	55 min (1)	63 min (1)	38 min	25 min

( ) = number of transfers

*Bus travel times can vary greatly. The times shown for 2030 are expected averages, after accounting for continuation of historic trends in bus speed degradation, as reflected in Pugest Sound Regional Council 2030 traffic forecasts.

TRANSIT TRIPS TO SELECTED CENTERS

Table 7 presents the percentage of commute trips made by transit riders to a selected set of regional centers.

The existing transit share data is from the 2000 U.S. Census Journey-to-Work survey as compiled by the Puget Sound Regional Council.

Percentages include ridership on fixed route, fixed schedule transit service. Excluded are paratransit, dial-a-ride, carpools and vanpools, etc.

Table 7: Projected activity center mode splits

	Existing transit share of commute trips	ST2 2030 share of commute trips	Percent change from existing to ST2 2030
Lynnwood	3%	4%	+33%
Northgate	6%	9%	+50%
University District	20%	33%	+65%
Downtown Bellevue	8%	12%	+50%
Downtown Seattle	40%	50%	+25%

Other benefits of ST2

COST SAVINGS FOR TRANSIT RIDERS

According to the U.S. Census Bureau, in 2003 the average family in our region spent 18 percent of its disposable income on transportation, more than any other expenditure except housing. The average household had 2.3 people, owned 2.4 cars, and spent $9,350 a year on transportation.

The most expensive cost of driving is the cost of owning and insuring a vehicle. A family that can own one less car because of better transit service can save thousands of dollars a year on transportation. Even a family that owns the same number of cars, but drives less, stands to save on vehicle operating costs – gas, oil, parking, tires and maintenance.

For those commuting by transit to places with high parking costs, the savings in parking alone are substantial. For example, a monthly Puget Pass good for unlimited $2.25 rides (the two-zone peak hour fare on King County Metro) costs $81. According to the Puget Sound Regional Council, the average cost of parking in the region's downtowns in 2006 was $138 a month. For the average transit commuter to Downtown Seattle, savings in parking alone would be approximately $700 a year, on top of the savings on gas and other vehicle operating costs.

Operations and maintenance costs, fare revenue and operating subsidies

OPERATING REVENUE/OPERATING EXPENSE RATIO

Table 8 shows the forecast ratio of operating revenue to operating expense by service in 2030. This ratio, also known as farebox recovery, is the operating revenue (primarily fares) divided by the costs of operating Sound Transit's services.

OPERATING COSTS AND RIDERSHIP ON EACH ST2 LIGHT RAIL EXTENSION

Map 1 on the following page illustrates the annual transit ridership volumes in 2030 on each of the three light rail extensions proposed in ST2. The annual system operating costs allocated to each of these ST2 extensions is also shown.

COST EFFECTIVENESS

Table 9 reflects the annual operations and maintenance cost of the ST2 plan per additional rider over the cost of the existing system.

Table 9: Annual projected cost per ST2 system rider and new rider (2007$)

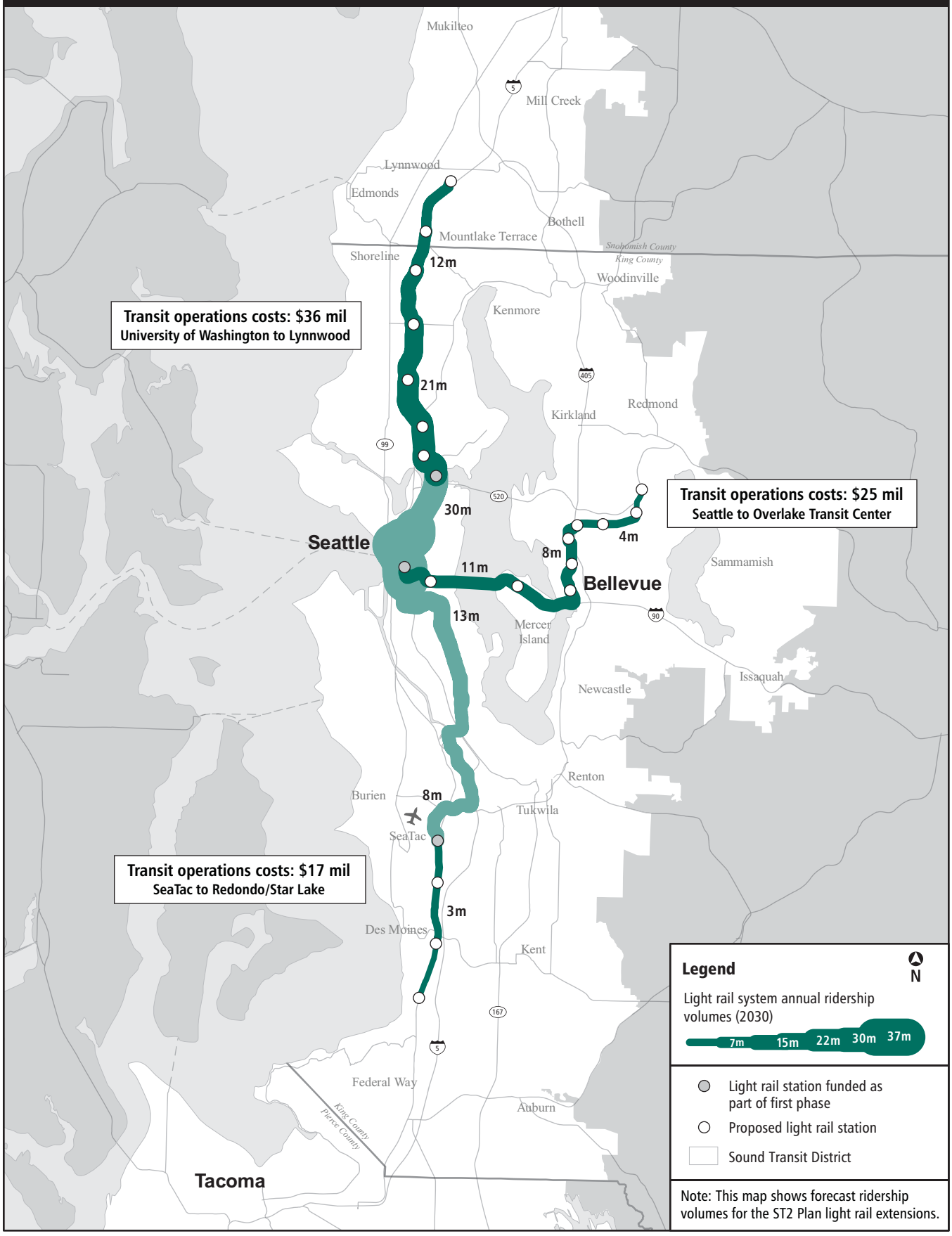
	With ST2 in 2030
Annual cost per ST2 system rider –	
ST2 transit operations	$1.96
ST2 capital	$8.38
Annual cost per new transit rider –	
ST2 transit operations	$4.60
ST2 capital	$19.70
Total annual cost and ridership	
ST2 transit operations cost (millions)	$92
ST2 capital cost (millions)*	$394
ST2 riders (millions)	47
New transit riders (millions)	20

* Note: Annualized ST2 capital cost is the $9.1 billion total capital cost (2007$) discounted at 3 percent over 40 years.

Table 8: Sound Transit's total forecasted operating revenue/operating expense ratio in 2030

	Annual riders (millions)	Transit operations cost (2007$ millions)	Operating revenue (2007$ millions)	OR/OE ratio (farebox recovery)
Link light rail	88.5	$127	$52	41%
Sounder commuter rail	6.5	$54	$15	28%
ST Express bus	14	$113	$16	14%
Sound Transit total	**109**	**$294**	**$83**	**28%**

MAP 1: ST2 PLAN LIGHT RAIL ANNUAL RIDERSHIP AND OPERATIONS COSTS (2007$)



Comparing the capacity of rail systems and highways

HIGHLIGHT For the first time, between 2003 and 2005, WSDOT found that on several freeways in the Central Puget Sound region, peak period vehicle volumes are dropping because the freeways are so congested and travel speeds are so slow that peak freeway capacity is declining.

HIGHWAY CAPACITY

The capacity of a single highway lane is defined as the highest number of vehicles that can pass a single point in an hour in a lane experiencing a stable flow of traffic.

Transportation planners calculate that maximum freeway capacity – up to 2,000 vehicles per hour per lane – is achieved at speeds of about 40-45 mph. When the speed falls to 30 mph, capacity can be reduced to as few as 700 vehicles per lane per hour.

Because the number of people per car is generally lower during commute hours than at other times, averaging about 1.1 people, the theoretical capacity of a single lane in the peak hour is 2,200 people. However, this assumes traffic moves at about 40-45 mph with perfect free flow conditions. At higher speeds the longer distances between vehicles reduce the capacity of the freeway, and at slower speeds the conflicts between vehicles – that is stop-and-go traffic – also reduce capacity.

Other factors affecting capacity include collisions, disabled vehicles, spills and other events that impede the normal flow of traffic, as well as poor weather conditions that reduce visibility.

The Washington State Department of Transportation tracks peak period highway performance in Central Puget Sound for 35 different city-to-city commutes. Between 2003 and 2005 travel times worsened for 33 of these 35 commutes. Ironically, the slower the travel speeds due to congestion, the lower the capacity of the freeway links on which the congestion occurs; that is, the greater the demand for travel, the more likely it is that fewer vehicles will be able to use the roadway. According to WSDOT annual system performance reports, particularly bad locations include:

- I-5 at I-90, which operates at less than 40% capacity for over 10 hours a day;
- I-5 near Northgate, which operates at about 70% capacity for almost 10 hours a day; and
- I-405 at SR 169 in Renton, which operates between about 50-60 percent capacity for 14 hours a day.

Bellevue-based commutes are the worst

The worst congestion problems in 2005 were for people commuting to and from Bellevue for work. During the average evening, the Bellevue-to-Tukwila commute experienced congestion and loss of capacity for five hours and 35 minutes, and the Bellevue-to-Seattle SR 520 commute experienced congestion and loss of capacity for four hours and 50 minutes.

LINK LIGHT RAIL CAPACITY

The capacity of rail transit is a combination of the size of the vehicles, how frequently they run and the level of crowding.

As with highway capacity, when speaking of rail capacity the important measure is the number of passengers that can be carried during the peak period, when the service is most in demand. This is usually referred to as "peak passengers per hour in the peak direction."

The per-hour and all-day passenger moving capacity of the ST2 light rail system is quite large, especially in comparison to a roadway of similar width with mixed traffic. While no rail transit system runs fully loaded 24 hours a day, the difference between the ultimate system capacity and the ridership forecast shortly after opening represents the reserve of capacity for accommodating a large amount of future ridership demand in the decades after the system is built. **Table 10** presents the hourly passenger capacity of the ST2 light rail

Table 10: Light rail system capacity (passengers per hour per direction)

Peak frequency (minutes)	4-car trains per hour	Seated capacity (74 per car)	Comfortable capacity (150 per car)	Crowded capacity (200 per car)
2	30	8,880	18,000	24,000
4	15	4,440	9,000	12,000
6	10	2,960	6,000	8,000
8	7.5	2,220	4,500	6,000

system at points in the system with varying frequencies of train service, at three different loading standards: all passengers seated, a comfortable level of standing passengers and a "crowded" load that might only be accommodated during peak times for short segments such as a major event.

Link light rail projected ridership in 2030 shows that the system has the capacity to meet future growing demand.

As Link is extended to Northgate, and then to Lynnwood, the number of riders adding to peak ridership will increase with each additional station served.

Leaving Downtown Seattle going south, half the trains will be routed east across Lake Washington to Bellevue and Overlake/ Redmond, and half the trains will be routed south to SeaTac and Redondo/Star Lake. The Downtown Seattle Transit Tunnel can support train headways as low as two minutes, but the 2030 ridership would only require headways in the three- to four-minute range. **Table 10** shows the capacity of the system, but ridership is not expected to reach that level until well beyond 2030.

System reliability

Reliability means arriving at the same time every time, regardless of gridlock on the roads or snow on the ground. Reliability is a critical factor in how people plan their travel and budget their time. Transportation system reliability has continued to decline in the Puget Sound region for several decades, both for car drivers and for transit riders. This is primarily related to increases in the severity of traffic congestion, and in the greater likelihood of congestion occurring at any time of day or on any day of the week.

When people need to arrive somewhere by a specified time, whether to be on time for work, or to catch a plane or to watch a child's soccer game, they know that if the trip involves one of the region's most congested corridors at peak hours they should allow a great deal of extra time to get there. **Table 11** shows WSDOT's estimates of how much time a driver needs to allow for travel between certain points in the regional system due to the unpredictability of highway travel in the region.

Table 11: Regional highway travel time reliability

Route description	Travel time at posted speeds	Average peak travel time	Time to ensure 95% on-time arrival	On-time arrival % increase
From Seattle	(in minutes)	(in minutes)	(in minutes)	
Seattle–Everett	24	43	60	40%
Seattle–Redmond via SR 520	15	30	44	47%
Seattle–Bellevue via I-90	11	18	32	78%
Seattle–Bellevue via SR 520	10	21	32	52%
Seattle–Issaquah	16	23	37	61%
Seattle–SeaTac	13	19	28	47%
Seattle–Federal Way	22	37	56	52%
From Bellevue				
Bellevue–Everett	23	44	62	41%
Bellevue–Seattle via I-90	11	28	46	64%
Bellevue–Seattle via SR 520	10	26	38	46%
Bellevue–Tukwila	13	33	45	36%
From other locations				
Renton–Auburn via SR 167	10	20	33	65%

Source: WSDOT Gray Notebook: Measures, Markers, and Mileposts 9/30/07 p.68

HIGHLIGHT **Between 2003 and 2005, the duration of afternoon peak period congestion stretched from 2 hours to 3 hours and 15 minutes between Seattle and Redmond. Between Bellevue and Redmond it grew from 1 hour and 45 minutes to 3 and half hours.**

Increasingly, the problem of congested peak hours has spread to all hours of the day and even to the weekends. Buses are caught in the same traffic as cars and trucks. Freeway HOV facilities speed buses, but even these ramps and lanes often break down in the crush of peak period traffic and bad weather. Sounder commuter rail and Link light rail, although they share some grade crossings with vehicles, operate on their own rights-of-way free from conflicts with other traffic.

HIGHWAY RELIABILITY

Reliability on streets and highways is affected by many things including crashes, stalled vehicles and weather conditions, but the most important factor in the Central Puget Sound region is the volume of traffic and delays caused by congestion.

As detailed in **Table 11**, WSDOT tracks reliability on the freeways for major commutes between pairs of cities, and calculates "95% reliable travel times," that is the amount of time a driver needs to plan for to be sure of arriving on time 19 times out of 20.

WSDOT data, compiled annually in major corridors, shows reliability on the regions highways to be steadily declining.

TRANSIT RELIABILITY

Transit reliability is related to a number of factors, but most significantly to the portion of the transit trip that occurs on a transit-only facility – that is, rail or bus operating in its own right-of-way – away from interference with other traffic. **Chart 1** illustrates the increased access to exclusive right-of-way that will be experienced by the region's transit riders with ST2.

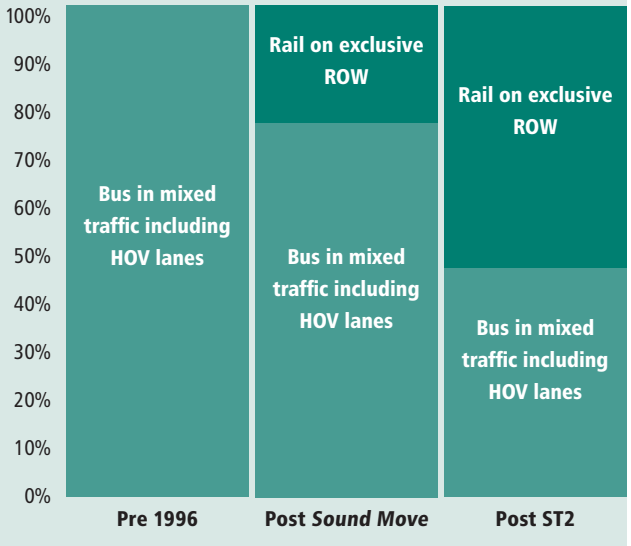
Sound Transit's Link light rail operates almost entirely on exclusive right-of-way. In addition, most of the right-of-way is grade separated with no interference from traffic. Even where there is no grade separation, Link light rail operates in exclusive right-of-way with signal preemption. This allows the service to maintain a very high level of reliability, at all times of the day.

Prior to *Sound Move,* 100 percent of the region's transit travel occurred on buses operating in mixed traffic. When the *Sound Move* investments are completed, 25 percent of the region's transit travel will occur on high-reliability rail lines.

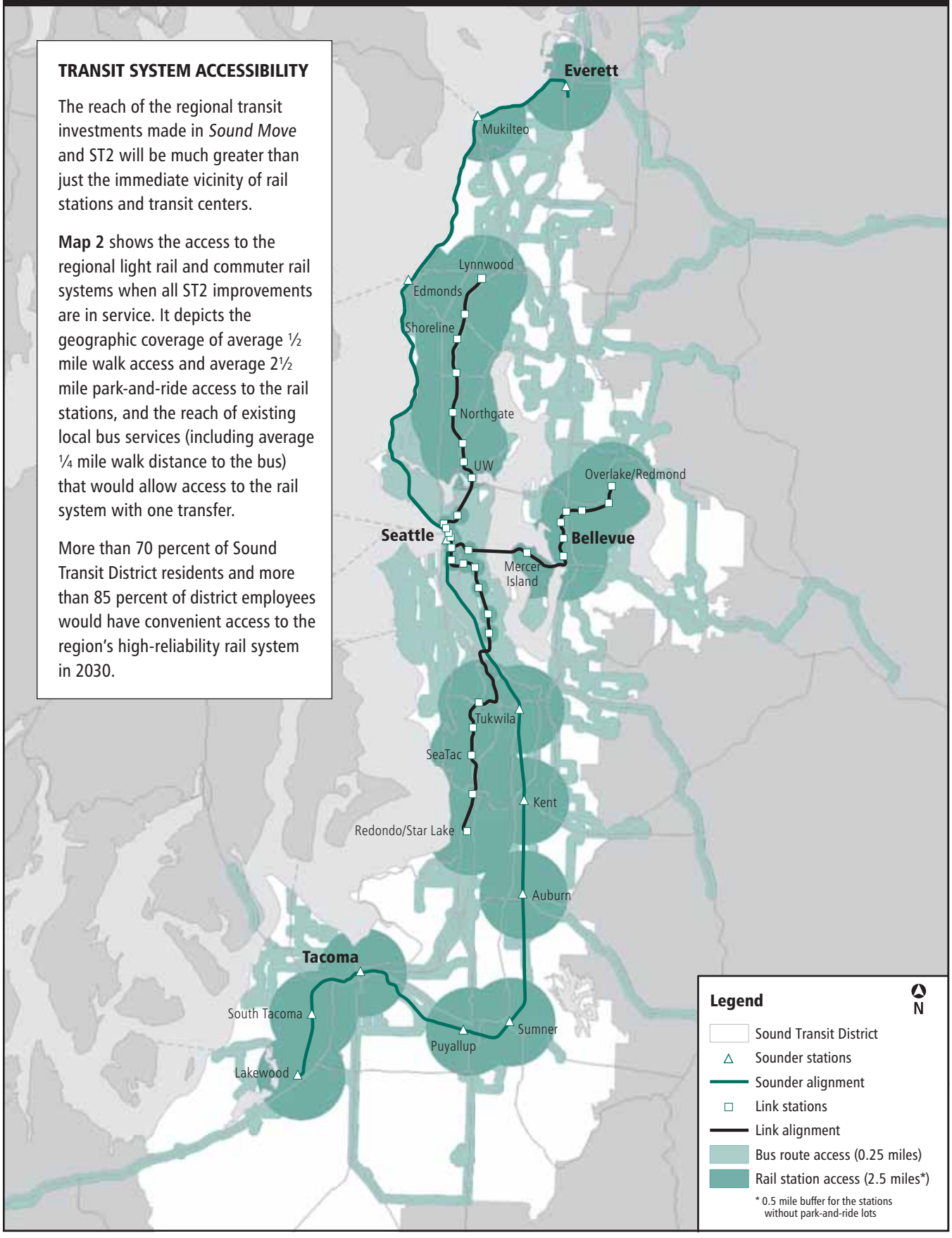
Looking ahead to the completion of ST2, the share of all transit riders in the region who are on Sound Transit services grows from 12 percent today to 65 percent in 2030. This means that over five times as many of the riders will travel on vehicles that don't get stuck in traffic, regardless of the time of day, day of the week, weather conditions, or other factors.

Chart 1: Percentage shares of passenger miles in mixed traffic vs. exclusive right-of-way

Transit reliability is related to the portion of the trip that occurs in exclusive right-of-way. As the percentage of rail trips increases, transit reliability will also increase.



MAP 2: COMBINED REGIONAL RAIL ACCESS



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SOUNDTRANSIT
RIDE THE WAVE

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SOUNDTRANSIT

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Appendix D:

Social, Economic and Environmental Impacts; Performance Characteristics by Mode; and Integration with Regional Land Use

Sound Transit 2

A Mass Transit Guide

The Regional Transit System Plan
for Central Puget Sound

July 2008

SOUNDTRANSIT
RIDE THE WAVE

Table of contents

Adopted by Sound Transit Board, 7/24/08

Link light rail • Sounder commuter rail • ST Express regional bus • Tacoma Link light rail

Easy connections to more places for more people.

—Sound Transit vision statement

Sound Transit plans, builds, and operates regional transit systems and services to improve mobility for Central Puget Sound.

—Sound Transit mission statement

Social, economic and environmental impacts

SOCIAL IMPACTS

The Sound Transit 2 Plan (ST2) will reduce our reliance on automobiles by improving the average citizen's ability to use mass transit to travel through the most congested corridors during rush hours.

Mobility and accessibility

Mobility and accessibility are challenges for everyone, and particularly so for people who do not own cars or for whom the daily costs of driving are a financial hardship. The addition of 36 miles of light rail, plus enhanced Sounder and ST Express systems, will expand opportunities for low income workers to commute to their jobs, and for those who are unable or who prefer not to drive in order to travel to and from a variety of destinations throughout the region. Workers living along or near Link, Sounder, or ST Express routes and stations and traveling to jobs in the off-peak direction, for example at SeaTac Airport, Northgate Mall, or other locations, will have the same frequent reliable service as travelers to Downtown Seattle or Downtown Bellevue.

For low income households, ST2 investments may make it possible to reduce the number of cars per household, and/or to reduce the annual miles driven and costs of operations and maintenance. For those who are unable to drive or cannot afford an automobile, ST2 investments will greatly expand their ability to travel quickly and reliably throughout the region, whether they live along a Sound Transit route, or connect via local transit or demand-response services.[1] Mobility and accessibility can be a particular challenge for elderly people and people with physical disabilities or limitations. For many senior citizens and persons with disabilities, transit often offers the only option for getting around. Increasing the extent of the light rail system can significantly improve mobility for these citizens.

Other social impacts of ST2 include support for the urban centers developed in Vision 2040 and now contained in county and local government comprehensive land use plans and policies in the region. While the urban centers concept was developed primarily to reduce traffic congestion and air pollution growth, it also has potentially beneficial social impacts in promoting pedestrian-oriented neighborhoods throughout the region, which in turn will increase social contacts within communities and strengthen community spirit.

ECONOMIC IMPACTS

The Central Puget Sound region is not unique in its dependence on transportation to fuel its economic engine. What sets the central Puget Sound region apart from many other urbanized areas, however, are the extreme constraints that geography and topography place on the development of transportation corridors. For example, about a quarter of a million people cross Lake Washington every day using the only two routes available, I-90 and SR 520. Here, as elsewhere, the most congested sections of the freeway system experience gridlock for hours every day.

The investments planned as part of ST2 will not end congestion on the freeways. However, they will provide an alternative for drivers caught in traffic, free up road space for those with no other alternatives (including freight), and provide new high capacity alternatives for those who are unable, unwilling or who can't afford to drive. To those people who are able to use and benefit from the faster and more reliable transit services that comprise ST2, it will seem as though congestion has been eased substantially.

ST2 will provide major new rush hour capacity to and from the region's most congested destinations, as well as all-day, two-way reliable connections for commuters, shoppers and other travelers.

The economic benefits of the ST2 plan will be realized in many ways, some of which can be quantified and others of which are more difficult to measure. Taking into account the full costs of the ST2 Plan, Sound Transit estimates that the readily quantifiable benefits will be greater than twice the costs.

Quantifiable benefits

ST2 Plan quantifiable economic benefits include:

- Travel time savings for transit riders;
- Mobility benefits for non-transit users including commercial vehicles;
- Reductions in vehicle operating costs, including parking costs; and
- Reductions in accident costs and in pollution, noise and energy use.

[1] About 9 percent of the region's households are classified as low income, and of these households 26 percent do not have access to a car. (Of all households in the region, only 7 percent do not own or have access to a car.) About 17 percent of the population is disabled, and by 2040 almost 17 percent will be seniors. Compared to others, all of these individuals tend to have lower auto ownership rates, lower incomes, and be less likely to have a car available to them for their trips.

Travel time savings

Travel time savings are shown in Appendix C (see page C-5) for both transit riders and non-transit users. These benefits constitute the largest share of the benefits of the ST2 Plan.

Vehicle cost savings

In addition to saving time, the region will save in vehicle ownership, operating and parking costs.

Savings in environmental costs

The ST2 investments can create environmental benefits by reducing air, noise and water pollution associated with auto travel. In addition, transit travel is more energy efficient than auto travel, creating economic benefits associated with energy conservation.

Benefits difficult to quantify

Job creation and retention

Improving the capacity and reliability of the transportation system directly supports the region's economy. It gives employers access to a broader base of workers, and gives individuals greater choice in where to live, work, recreate, shop and conduct personal business. It gives businesses better access to goods and services, and increases the ability of people to connect with each other and conduct business.

A 1999 study done for the American Public Transit Association concluded that business gains in sales are 3 times the investment in transit capital – a $10 million investment yields $30 million in sales.

In Portland, Oregon, Tri-Met estimates that over $6 billion in development has occurred within walking distance of the MAX light rail stations since 1980.

In Dallas, property values near light rail stations are 13 percent higher than elsewhere, and in San Diego they are 17 percent higher.

While these types of calculations are difficult to replicate for a project that is not yet built, in city after city across the United States, the economic benefits of past investments in transit infrastructure are clear.

ST2 projects will create thousands of jobs in project management, design and construction, as well as ongoing jobs in operations and maintenance. If the dollars invested in ST2 were spent elsewhere, it would also create jobs, but the portion of the project costs that will be covered by federal grants would not otherwise come to the region. In 2006, USDOT estimated that 47,500 jobs are created for every one billion dollars invested in transportation.

Sound Transit's Guiding Principles provide for: workforce diversity reflective of the region; maximum use of local businesses; maximum use of small businesses; and maximum use of minority, women and disadvantaged businesses. There is also a requirement that a minimum percentage of labor on Sound Transit projects be performed by apprentices, with requirements for minority and female workers.

Transportation system reliability

Recent research on travel reliability shows an increased awareness of the importance of the reliability of transportation systems in large metropolitan areas. That awareness is heightened as existing transportation systems suffer increasing frequency of breakdowns when operating at capacity. As the importance of reliability grows, so does transit ridership, yielding even greater travel time savings to even more people.

Added capacity for travel

Whether going to work, school or shopping, or simply to visit friends, the ability to travel has economic benefits. ST2 adds major new travel capacity in some of the region's most congested corridors in all three counties. The added capacity for trips throughout the region will benefit individual travelers and the region as a whole. Additional information on transit capacity is shown in Appendix C.

Mobility for all

Improvements in transit provide broad benefits to those who cannot afford to own and operate a car, or who cannot or do not wish to drive, expanding opportunities for work, education, medical care, shopping and other opportunities that require travel. These benefits also accrue to other taxpayers.

ENVIRONMENTAL IMPACTS

In June 2005 Sound Transit issued a supplemental final environmental impact statement (SEIS) on the Regional Transit Long-Range Plan. The 2005 SEIS builds on and supplements the 1993 EIS prepared for the Regional Transit System Plan. It addresses newly available information on existing environmental conditions, and it evaluates the environmental impacts of, and potential mitigation measures for, adopting and implementing an updated Regional Transit Long-Range Plan, including specifically the development of the ST2 Plan investments.

The ST2 Plan investments will have a positive impact on the region's environment, including reduced energy consumption and air pollution and improved water quality. Sound Transit's 2005 SEIS for the Long-Range Plan details these impacts for different ranges of long-term investments; the ST2 Plan represents the moderate-to-aggressive end of these investment ranges. An overview of the impacts for air quality, water quality and energy use are presented here. In addition, the 2005 SEIS details impacts in the areas of transportation (see Appendix C of this plan), environmental health, ecosystem, aesthetic quality, parks and recreation, historic and cultural resources, and other areas.

The transportation sector represents over 50% of the regional carbon footprint, significantly more than the national average. Overall, the ST2 Plan represents an important step towards addressing the challenge of global warming by offering a reliable alternative to motor vehicle travel. The ST2 Plan will reduce Vehicle Miles Traveled (VMT) on our region's roadways which in turn reduces greenhouse gas emissions such as carbon dioxide. Internal estimates predict that implementation of the ST2 Plan will result in a reduction of about 268 million VMT in 2030 by providing an alternative to single occupancy vehicle use.

In addition, the ST2 Plan fosters transit-oriented development around stations, helping provide for compact, urban, sustainable communities that have relatively smaller carbon footprints.

Furthermore, the Sound Transit Board is committed to exploring ways to reduce, to the maximum extent practicable, the greenhouse gas emissions during construction and operation of the ST2 Plan.

Air quality

Forecasts for increased 2030 ridership and resulting changes in travel by all modes indicate that ST2 Plan improvements would reduce total regional VMT and vehicle hours traveled in 2030 with a corresponding reduction of motor vehicle emissions. With the ST2 Plan, both the number of VMT and the level of congestion, as measured by hours of vehicle delay, would be reduced. As a result, overall mobile source pollutant emissions, including carbon monoxide, nitrogen oxides, volatile organic compounds, hazardous air pollutants and greenhouse gases, within the plan area are expected to be lower compared to the No Action Alternative that was evaluated.

Sound Transit's light rail is electric powered and the use of electric vehicles will reduce transit vehicle emissions.

Sound Transit's regional transit providers are retrofitting their older bus fleets with particulate filters that remove approximately 90 percent of the diesel particulates that the buses previously released.

Sound Transit uses modern diesel commuter rail locomotives that produce substantially less air pollution than the majority of locomotives in use today. Sounder trains would produce approximately 30 percent less aggregate air pollutants per rider than three-person carpools.

Water quality

Potential water quality impacts include: (1) new impervious surfaces, (2) new pollutant-generating impervious surfaces, (3) flood plain fill, and (4) culvert extensions. The overall impact of ST2 projects on increasing the amount of pollutant-generating impervious surfaces will be relatively minor compared to the current amount of pollutant-generating impervious surfaces in the region, as well as compared to possible alternate investments in road capacity to carry the same number of trips.

Energy use

When compared to taking no action to improve the transit system, the ST2 Plan will result in a reduction in regional energy use for transportation.

Mitigating local impacts

In developing the projects for the ST2 Plan, the costs of environmental impact mitigation were included in the cost estimates for each project. For example, the Link extension from Seattle to Bellevue cites potential parkland, historic and wetland impacts and the need for environmental mitigation. For those projects in the early stages of development, detailed analysis of impacts and potential mitigation measures will be finalized in project environmental documents.

In addition to mitigating specific project impacts, ST2 projects also have the potential to mitigate some of the major impacts of other anticipated regional transportation projects. In the North Link corridor, for example, there is a major resurfacing (and possibly lane reconfiguration) project planned for I-5. Depending on the schedules of the two projects, Link to Northgate could provide an alternate route for travelers who might otherwise be caught in the additional congestion associated with this construction.

Environmental Management System

Sound Transit adopted a comprehensive Environmental Management System (EMS) in April 2004. The EMS consists of proactive management processes and procedures to document, assess and improve environmental compliance and performance. It incorporates environmental ethics into business operations and identifies environmental stewardship as a responsibility of all employees. Sound Transit's Environmental Policy, which serves as the foundation of the EMS, commits the agency to being an environmental leader in the State of Washington and to "the protection of the environment for present and future generations as we provide high-capacity transit to the Puget Sound region."

Additionally, in 2008 Sound Transit became only the sixth transit agency in the United States, and the first on the West Coast, to hold itself accountable for achieving rigorous international standards for promoting environmental sustainability. This commitment earned Sound Transit ISO 14001 certification. To meet the requirements for ISO 14001, an organization must put in place management tools enabling it to identify and control the environmental impact of its activities, products or services and to improve its environmental performance continually. It must also implement a systematic approach to setting environmental objectives and targets and to demonstrating that they have been achieved.

Performance characteristics by mode

SYSTEM AND SERVICE PHILOSOPHY AND IMPACTS

Sound Transit's role is to provide the Central Puget Sound with a regional network of high-capacity transit services. As defined by Sound Transit's enabling legislation, high-capacity transit means service operating principally on exclusive rights-of-way and providing a substantially higher level of passenger capacity, speed and service frequency than public transit operating on highways and city streets in mixed traffic.

This role is further defined by the Puget Sound Regional Council's land use plan, Vision 2040, and the Metropolitan Transportation Plan, which together define a goal to establish a region-wide transit system that connects regional growth centers, provides seamless connections with local transit and ferries, and supports concentrated development at and around stations.

Within this framework, the ST2 Plan proposes to continue and expand the regional high-capacity network established in *Sound Move*. Link light rail will add 36 miles extending to Snohomish County and across Lake Washington to King County's eastside. The ST2 Plan will add new or improved Sounder commuter rail stations and access improvements. The ST2 Plan also includes contributions to new ST Express bus facilities in Bothell and Burien. Consistent with the major expansion in rail services, some existing express bus routes will be replaced with rail.

Service characteristics for Sound Transit's three modes are consistent with the mandate to operate high-capacity transit with frequent, fast service.

ST EXPRESS BUS

ST Express operates frequent, all-day bus service on major corridors between centers, with half-hour headways or better, from about 6:00 in the morning or earlier until about 10:00 at night. ST Express buses operate on freeway HOV facilities where they are available, including a series of freeway direct access ramps built as part of *Sound Move*, which improve speed and help ensure reliability.

ST Express buses serve major urban centers as well as outlying park-and-ride lots and transit centers, and they connect to Sounder and existing and future Link stations. All buses carry bicycles; some serve mixed-use transit centers with commercial and residential development integrated into the center.

SOUNDER COMMUTER RAIL

Sounder commuter rail currently operates between Everett and Tacoma and, when the *Sound Move* investments are completed, will extend to South Tacoma and Lakewood.

By the end of 2008, Sounder commuter rail will operate eight daily round trips between Tacoma and Seattle and four daily round trips between Seattle and Everett. Eventually, trains will operate approximately every half hour during the morning and afternoon weekday peaks. Special service also serves Mariners baseball and Seahawks football Sunday home games.

Fifty-eight bi-level passenger cars seat 140 passengers each, with room for bikes and wheelchairs. Amenities include work tables, power outlets, cup holders and overhead storage. Maximum speed is 79 mph, and the travel time from Everett to Seattle or Seattle to Tacoma is about an hour. There are currently 10 stations in service; when *Sound Move* is completed there will be 12 stations in service. ST2 investments will improve some stations and add parking.

LINK LIGHT RAIL

Tacoma Link currently operates electrically-powered single-car trains between the Tacoma Dome Station and Downtown Tacoma. At the Tacoma Dome Station it connects with Sounder, ST Express, Greyhound and Amtrak, and in downtown it connects with Pierce Transit's local bus service. Tacoma Link serves the University of Washington Tacoma, the Washington State History Museum, the Museum of Glass, the Convention Center, the downtown business district and the Broadway Theater District. Trains operate every ten minutes.

Central Link, now under construction between Downtown Seattle and Sea-Tac International Airport, is a 16-mile electric light-rail line with 13 stations, predominantly on exclusive right-of-way. Initial service will be with two-car trains, but the station platforms can accommodate up to four-car trains for future service expansion as demand grows.

When service begins operating in 2009 it is expected that trains will run approximately every six minutes during peak hours and every 10 to 15 minutes off-peak and at night. The trip between Downtown Seattle and Tukwila will take about 30 minutes. A planned extension to the University of Washington is expected to begin operating in 2016. By 2030 the ridership on Central Link is expected to exceed 110,000 riders a day.

As part of ST2, Link will be extended north to Lynnwood, south to Redondo/Star Lake, and east across Lake Washington to the Overlake Transit Center area of Redmond. The technology will be the same as Central Link, with exclusive and largely grade-separated rights-of-way.

Integration with regional land use planning and transit-oriented development

REGIONAL LAND USE PLANNING

ST2 investments are consistent with the vision and goals in the region's land use, growth management and transportation plans. Light rail, commuter rail and express bus services will carry thousands of people in the region's most dense, most highly congested corridors, and these transit services will deliver people to and from the hearts of the region's downtowns and other activity centers.

Achieving Vision 2040

Vision 2040, adopted by the PSRC in 2008, establishes a regional growth management strategy for Central Puget Sound based on defining urban growth boundaries, containing growth within those boundaries and concentrating new development in multiple centers linked by a high quality transportation network, including high-capacity transit in major corridors.

ST2 will provide an important piece of the transportation components necessary to implement Vision 2040. ST2 supports the Vision's strategy of concentrating growth within urban growth boundaries and supporting that growth with robust mass transportation alternatives such as light rail, express bus and commuter rail services. For example, the urbanized portions of Pierce, King and Snohomish counties are within a defined urban growth boundary whose population is expected to increase by one million people by 2030. The employment within that boundary is expected to increase by about 600,000 jobs. ST2 includes high-capacity transit service that will serve over 50 percent of the employment in PSRC designated urban centers in 2030.

Looking ahead to 2030, by which time the region will need to accommodate more than one million new residents, successfully confining growth within urban growth boundaries will depend on the region's ability to develop adequate infrastructure to support more dense development. High-capacity transit is central to this effort.

Since the initial adoption of Vision 2040, the region has repeatedly affirmed its growth management strategy in adopted regional, county and city comprehensive plans. The most recent Metropolitan Transportation Plan, Destination 2030 (PSRC, 2001), calls for the region's high-capacity transit system to continue to develop and expand to help meet growing demand, together with the expansion of all forms of transportation—local transit, carpools and vanpools, ferries, airplanes, automobiles, freight, bicycling and walking.

Sound Move, Sound Transit's initial phase of regional high-capacity transit investments, is already addressing many regional mobility needs. The investments of *Sound Move* will continue to provide benefits for decades to come. However, *Sound Move* was intended to be the first phase of a more extensive regional high-capacity transit investment. Growth has worsened the region's transportation problems and there is a continued need to address high-capacity transit planning and investment.

Between now and 2030, population is expected to grow approximately 30 percent, with a projected 35 percent growth in employment and a 30 percent increase in vehicle miles traveled. In recent decades, miles traveled has grown twice as fast as population and four times as fast as employment.

Fortunately, future projections show the relative growth in travel moderating compared to the recent past, largely because of the leveling off of certain demographic trends such as the increase in numbers of workers per household.

The region's transportation capacity for all modes has not kept pace with growth, and new growth means that transportation conditions will worsen even further. Many of the region's roads and freeways are already operating at capacity for many hours during the day. With more vehicles on the road, congestion and delay will be more severe and trips will be slower and more unpredictable.

The expanded high-capacity transit system in the ST2 Plan will provide an effective and reliable alternative to driving and an efficient way for people to move throughout the region. The expanded high-capacity transit system implements an integral transportation component of Vision 2040 and Destination 2030.

Reducing land area devoted to parking

Extending the regional mass transit system to more of the region's employment centers will enable many more employees to travel to jobs in those centers by high quality transit instead of by car. This will, in turn, reduce the demand for parking in those employment centers. Parking cars in structures requires 300 to 400 square feet per car, which means that a single worker with a car requires about twice as much space as a worker without a car. By reducing demand for parking in urban centers, more land can be devoted to productive economic activity and less to storing vehicles.

TRANSIT-ORIENTED DEVELOPMENT

During *Sound Move* implementation Sound Transit has had a Transit-Oriented Development (TOD) Program. The purpose of this program has been to encourage easy access to high-capacity transit and easy transfers between commute modes, including walking, bicycling, other transit service and, where appropriate, driving. Sound Transit has worked with public and private partners to promote such connections. Sound Transit will continue its TOD Program in the ST2 Plan.

Sound Transit and its partners have effectively located transit stations to support and generate TOD during *Sound Move* implementation. Notable examples are the Sumner Town Center, the Tacoma Dome District, the Newberry Square Project at the Ash Way park-and-ride lot, the Othello Station development in Seattle, and new development and redevelopment around Sounder stations in Kent and Auburn. Virtually every city with Sound Transit projects worked with Sound Transit to develop station area plans. These plans intend that development in and around stations maximize the value of the transit investment to the communities it is designed to serve.

During the implementation of ST2, Sound Transit's TOD Program will strive to achieve pedestrian-friendly development around the high-capacity transit stations. The ST2 TOD program will promote development resulting in:

- reduced automobile use made possible by a shift from cars to walking and transit;
- higher transit ridership;
- enhanced livability and walkability in the communities Sound Transit serves;
- calmed traffic and reduced local congestion;
- streets designed to promote a sense of community within the station area;
- the ability to manage parking demand;
- a more sustainable environment, both locally and regionally;
- reductions in energy consumption, especially fossil fuel reductions;
- reductions in the emission of pollutants, especially greenhouse gases; and
- more diversity in the economic bases of communities near stations.

TOD project design emphasis will include a focus on facilitating station access for pedestrians, bus riders, bicyclists, station drop-offs, and where appropriate, parking.

The ST2 Plan includes 19 new light rail stations and 10 new or improved Sounder stations. Sound Transit will work with local jurisdictions, partner agencies and private interests to encourage mixed-use, pedestrian oriented development around stations.

Sound Transit will prioritize efforts in communities that are already encouraging increased density through locally developed zoning and comprehensive plans.

Sound Transit will encourage public-private partnerships on a voluntary basis. Sound Transit has a variety of tools it can use to encourage TOD. One is facility design and location. Another is through real estate transactions. A third is through service planning. All of these tools necessitate active cooperation with stakeholders and partner agencies. Even where a partnership cannot be achieved, Sound Transit will, to the extent practicable, incorporate TOD into station planning.

In the case of real estate transactions, it is important to note that Sound Transit does not have authority to purchase property to engage in speculative development. All property transactions involving Sound Transit must follow a rigid set of procedures designed to protect the rights of property owners.

Where a willing seller is present, Sound Transit may acquire additional property in order to facilitate TOD opportunities consistent with local land use plans and regulations.

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